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SOME OPINIONS AND COMMENTS ON CURRENT TELEPHONE TOPICS

Annual reports of telephone companies make better reading in recent years than formerly. Not especially because they record steady growth and financial prosperity—although this, of course, is gratifying—but because most of them are issued in much more interesting form.

It is apparent that a real effort has been made to give a "human interest" to these annual reports, and, by the use of pictures, maps and descriptive text matter, substitute some color for the old-style array of dry statistics. This is a good idea and will attract favorable public attention. Any method designed to acquaint the public with the working of a service company is helpful.

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For instance, the 1929 report of the Pacific Telephone & Telegraph Co. resembles the attractive folder of a travel bureau more than the dry-as-dust statistical exhibit that generally serves as a corporation report. It is filled with handsome photographs of exchange buildings and showing various types of construction work and scenes in the picturesque territory in California and the Pacific Northwest where the company operates.

Line cuts are effectively used throughout the report to show the station growth by states, the increase in central office equipment and the distribution of lines in open wire, aerial cable and underground cable. Maps show the toll cable program for the present year.

The 1929 report of the Southwestern Bell company devotes a section to halftone illustrations of telephone work, and includes a series of cuts showing how the company investment is divided, all of which will impress the layman with the telephone operations much more effectively than words and statistics.

Making corporation reports easy to understand is a wise move, for it helps public relations.

Women in Industry.

Last week in more than 1,000 communities throughout the country the organized business and professional women of America celebrated their achievements in the commercial world. One of the outstanding developments of modern times has been the increasing prominence of women in spheres that used to be regarded as belonging only to men. In politics, business life and the professions, however, the past 20 years have seen women taking a part so prominent that such old boundaries no longer exist.

Women have been an important factor in the telephone industry almost from its beginning. The first telephone exchange tried out male operators and boy messengers, but as soon as the business became organized on a basis even approaching efficiency, it became evident that this work could be performed much better by female help. Women soon took charge of the switchboard work, and today the public conception of telephone service can be summed up in the term, "the girl at central" or "the telephone girl."

As operators, traffic chiefs, supervisors and managers of various departments of the business, women are playing important roles in telephone organizations, and have shown themselves peculiarly fitted for this particular kind of work.

It has been a mutual advantage. If telephone work years ago—when most business lines were regarded closed to women—offered them an agreeable occupation and a chance to earn a living, it may also be said that the women of the telephone industry have contributed their full share to make the business the success it is today.

California's Position.

As California figured so prominently in the Senate hearing by sending several city attorneys to lodge a complaint against Bell telephone practices in that state, it is interesting to note that the California Independent Telephone Association has gone on record as being opposed to the proposed federal communications commission bill. In his March bulletin Secretary Ernest Irwin tells member companies why the association is against transferring their regulation by the state to a federal board.

Secretary Irwin says:

"The bill, as you no doubt know, is designed to establish a communications commission which would have jurisdiction over all telephone, telegraph and radio companies, taking the telephone companies from the jurisdiction of the Interstate Commerce Commission.

We realize that to many of the smaller

utilities of California the California Railroad Commission in San Francisco seems very far away to have to write or go to transact business with the regulatory body; and so because of our unfamiliarity with the procedure of the commission, we frequently hesitate and put off writing about matters concerning which inquiry has been made until we have almost forgotten what it was all about. Regulation from far-off Washington would practically end the regulation by our state commission.

The regulation by the Interstate Commerce Commission has not affected the telephone companies very much because the I. C. C. has had all it could handle in connection with the railroads. But a brand new commission, just starting out with all its future ahead of it and trying to show how effective it could be, would certainly keep us guessing for a time.

Telephone utilities have suffered in some ways from the I. C. C., owing to the fact that the commission, being familiar with the problems of the railroads, tried to find a similarity between the railroads and the telephone companies. Our accounting people have found this out in connection with the late studies on depreciation. But as President MacKinnon of the United States association told the Senate committee, we know where we are at even if we do not think we should be hitched with the railroads; and we prefer the railroads to the 'kicking and biting herd known as the radio industry' for associates.

Did you read the full report of the appearance of the telephone representatives before the committee? It was in TELEPHONY of February 15 and is worth reading. Five other men appeared with Mr. MacKinnon to represent the Independent telephone industry.

Your own board of directors at its meeting held on February 26 directed your secretary to forward to each California senator and representative a protest against any change in present methods of regulation of the telephone industry, stating that any action affecting the relation now existing between public utilities and state regulatory bodies would, we believe, be retrogressive."

COMING CONVENTIONS

Iowa Independent Telephone Association, Des Moines, Hotel Fort Des Moines, April 8, 9 and 10.

Ohio Independent Telephone Association, Columbus, Deshler - Wallick Hotel, April 15, 16 and 17.

Indiana Telephone Association, Indianapolis, Claypool Hotel, May 6 and 7.

Kansas Telephone Association, Topeka, Hotel Jayhawk, May 13, 14 and 15.

Pennsylvania State Telephone & Traffic Association, Penn-Harris Hotel, Harrisburg, May 13, 14 and 15.

Up-State Telephone Association of New York, Seneca Hotel, Rochester, May 21, 22 and 23.

Protecting Little Business.

A recent report to the U. S. Department of Commerce shows that the government is interested in finding out why small business concerns fail. This report covers an investigation of failures of retail stores since last November, and includes a study of the subject by Judge Clark of the United States District Court of New Jersey and representatives of the Department of Commerce and of the Yale Institute of Human Relations.

The report indicates that 75 per cent of the failures listed were due to disregard of fundamental rules of business caution, chiefly those pertaining to credits. This means, in other words, that industry and ordinary business sense will carry 75 out of 100 concerns to a fair degree of success. This is encouraging as it demonstrates that the United States is still a favored country where hard work, honesty and average good management will reward the deserving.

* * * *

It is also gratifying to observe that Uncle Sam is interested in keeping watch over what may be called small business but which still constitutes the great bulk of American industry, notwithstanding the rapid breeding of great mergers. In this connection the federal government has a duty to perform in preventing these huge combinations from using their size and financial power to crush the smaller concerns.

It is a good thing to watch the little fellows and try to keep them on the right track, but it is equally important to protect them from their more powerful competitors collectively known as "Big Business."

There are laws and government machinery to insure this protection from monopoly, but it requires constant vigilance to preserve fair competition in any industry.

The Telephone System: Important Phases

Here is Another Section of Forthcoming New Volume "Telephone Theory and Practice," Parts of Which Are Being Given Advance Publication in "Telephony" Outline of Some of the More Important Phases of Telephone Systems—Part 1

By Kempster B. Miller

To the average layman, the *telephone* is merely an instrument, but to the telephone man it is a *system*.

According to his experience and breadth of vision, the system he visualizes may be the small collection of associated apparatus with which he is immediately concerned; it may be the telephone exchange of his village, town or city; or it may be some grander conception, as of a universal system, which by wire lanes and other lanes, shall so cover the face of the globe as to place all people, whether on land or sea, or in the air, in speaking relation with one another—the ultimate destiny of the art. Any one of these interpretations, and many others, may be correct. The term "telephone system" may comprehend little or much.

In the broader view, the most comprehensive telephone system so far actually achieved, is that covering the entire United States from ocean to ocean, and reaching into Canada, Mexico and across the Atlantic to most of Europe. Some idea of the extent to which this covers the United States may be gained from Fig. 24, which shows in a general way the network of toll lines connecting various exchange areas.

The recent linking together of the United States and England by several separate wireless telephone channels has permitted the establishment of daily commercial service which allows the people within reach of the vast wire networks of the United States and of Western Europe to converse with one another. A transatlantic telephone cable is in course of construction to make this service more reliable and to give more channels.

Truly these are impressive steps toward the concept of a world-wide telephone system suggested in the opening paragraphs. That concept is not as Utopian as it may at first appear. From the purely technical

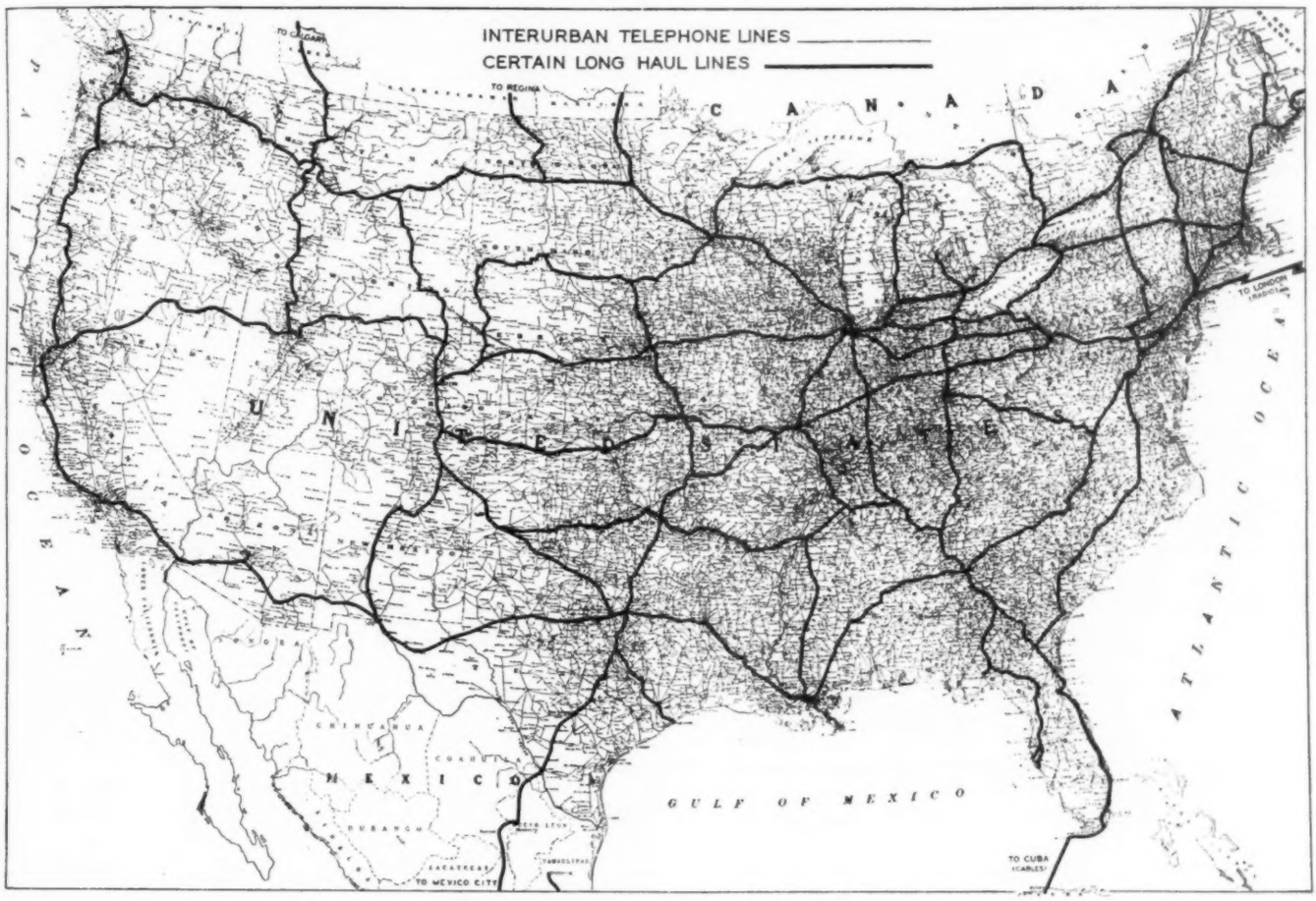

INTERURBAN TELEPHONE LINES
CERTAIN LONG HAUL LINES
TO REGINA
C A N A D A
U N I T E D S T A T E S
M E X I C O
GULF OF MEXICO
ATLANTIC OCEAN
TO LONDON
TO CUBA

Fig. 24. Toll Lines of the Bell Telephone System.

standpoint it could be achieved now. No doubt the telephone system of the world will be extended into all countries as fast as it is commercially warranted.

But comprised within such a super-telephone system there are innumerable other systems of many kinds and of varying degrees of complexity, performing numerous and diverse functions.

In the first place, there are the exchange systems themselves. Each of these is a complete system of local intercommunication. They are of many kinds, and may be classified in various ways. For instance, there are manual, automatic, and semi-automatic exchanges, according to whether the central office switching is done by hand, by machine, or by a combination of the two; and on another basis of classification, there are single or multi-office exchanges, according to whether there are one or several central offices serving the exchange area in question.

Each exchange system in turn comprises within itself a number of minor systems, each performing a separate function or group of functions. Among these may be mentioned: Systems by which current is supplied to the transmitters of the telephones; systems by which the telephone-user signals to the central office operator; systems of attaching one or several telephones to a single line; system of selectively or non-selectively ringing the bells on a line to which several telephones are connected; systems by which the patrons are charged for the service rendered, and so on.

Then, as distinguished from the exchange system, there is the long distance system. No one has ever succeeded in drawing a sharp line to show where the exchange system ends and the long distance system begins. As a matter of fact, there is no such real line for the two are inextricably interwoven, and any such line of demarcation as is needed for administrative purposes must of necessity be drawn in somewhat arbitrary fashion.

On the map, the long distance system looks rather simple, mere lines connecting the various dots representing the cities and towns, but in practice it is not so. There are long distance switching systems, and there are various systems for improving the efficiency of the lines. Among these these latter are phantom, composite and carrier current systems by which each line is made to carry more than one message at a time; and there are also the loading and repeater systems which allow small wires to serve where large ones would otherwise be required.

Altogether, the long distance system is one of the most remarkable triumphs of engineering. Some of its devices, without which electrical communication on its present scale would be impossible, have come about only through the combinations of most ingenious inventive skill, the deepest research in the realm of modern science and mathematical reasoning of a very high order.

Throughout the whole realm of telephony, the system must be kept in mind. Just as each individual piece of equipment must function properly within itself and also with respect to all the other pieces which go to make up its particular minor system, so all the minor systems must function properly within themselves and in relation to all the other minor systems which go to make up their particular major system. And, in the last analysis, all of the major systems must with proper coordination act as units in that comprehensive scheme which, for want of a better name, I have called a super-system.

It is the purpose of this chapter to sketch in merest outline the course of development of some of the important phases of telephone systems. The details of this sketch will be filled in as far as possible when the various elements of apparatus, circuits, outside plant and methods are taken up in the chapters to follow.

Such a preliminary outline should facilitate the more detailed discussion to follow. It should also help one to keep in mind that the things being treated of are not detached units, but are in large measure intimately correlated in function, and often in

form, with other parts comprised within the system.

Talking Apparatus.

The germ of the telephone system was, of course, Bell's magneto instrument. It was the thing out of which the whole telephone industry has grown. Let us first see how this germ per se has developed. In its original form, the magneto telephone was a rudimentary affair. Its transmitting power was feeble; it was fragile, clumsy, unstable and on the whole quite unfit for commercial use even under the limited requirements of its time.

Without considering the effects of improvements that have been made in telephone lines and in other parts of the system, some idea of the extent of the development of the instrument itself may be gained when it is stated that the telephone of today is of itself about 32,000 times more powerful in its ability to transmit speech from person to person than was Bell's original instrument. Moreover, the present instrument is so rugged as to successfully stand rough handling and other vicissitudes of use, is pleasing in appearance, convenient in form, permanent of adjustment, and although complicated, is withal a thoroughly practical affair. In numbers, it has grown from one to many millions.

Signaling Apparatus.

The talking instrument alone would be of restricted utility. The early telephone had difficulty in making itself heard when applied directly to the ear and was quite unable to attract the attention of persons even a few feet away. Signaling apparatus had to be devised.

The problem was not as easily solved as with the mechanical telephone where by means of mere thumps on the diaphragm at the transmitting station, sufficiently loud sound-signals were produced by the diaphragm of the receiving station. The electric telephone was too delicate a device for such rough usage; but it is interesting to note that early attempts were made to signal in this way. One of these, known as Watson's "thumper," resulted from some of Watson's early work in this direction.

It was natural that early efforts at signaling should have been by means of battery current and battery bells. This, however, involved difficulties with respect to maintaining batteries of sufficiently high voltage and bells of sufficient reliability. The use of both the battery and the battery bell for signaling purposes passed out of the art at an early date. Later, the battery came back, but not the battery bell.

To meet the early deficiency of the battery as a source of signaling current, the so-called magneto generator was adopted. At first this was a mere adaptation of the old magneto electric machine devised primarily for giving people electrical shocks. It was in fact nothing more than a small hand-operated alternating-current dynamo. As later developed, and as now widely used in rural communities, it had a coil of wire which, by means of a hand crank and suitable gearing, could be made to revolve rapidly between the poles of a permanent horse-shoe magnet.

This step was apparently contrary to the trend of modern development, since it substituted man-power for fuel-power. Nevertheless, it was an important step for it solved the problem of generating currents that were well suited for distant signaling. The alternating currents of the magneto generator had sufficient power and voltage to be effective over lines of considerable resistance, and the range of frequency easily attained was about right for successfully operating signal bells.

The availability of this kind of signaling current at once led to the production of a simpler and more rugged form of bell—the polarized bell or "ringer," as it is generally called. This bell was developed by Watson in the form essentially as used today.

The Telephone Set.

With the development of suitable signaling apparatus, the prototype of what we now call the "magneto telephone," or "magneto telephone set" employed in "magneto systems" was evolved. Today we speak of the transmitter, receiver and induction coil as forming the "talking set," and of the combination of generator and ringer as the "signaling set."

As the talking and the signaling sets are used alternately, it was found necessary to provide, within the telephone, some sort of switching device so that they could be alternately connected with the line, and so that neither set would interfere with the functioning of the other.

This led to the "hook-switch," an important element of all telephone sets. Because it is made to form the only place upon which to conveniently hang the receiver after use, it automatically carries out the switching function without thought on the part of the telephone-user.

The magneto telephone was used almost universally until a few years before the beginning of the present century. Then, as will be shown, there began a reversion to the use of battery as a source of signaling current.

One of the results of this has been the doing away with the magneto generators, except in the telephone systems of small communities, where the magneto system still serves. For such use, nothing as good has been found to supplant it. Watson's polarized bell, however, has survived in universal use. Like Bell's receiver, it will be found in practically every telephone station throughout the world today.

The magneto system required that each telephone station be provided with two independent sources of electrical energy: one a battery to supply direct current to the transmitter; the other the magneto generator to supply alternating current for operating the distant signal. On its face this was an uneconomical arrangement. It meant a great scattering both of investment and of maintenance effort.

Today, practically all except rural communities are served by what is called the "common battery system." In this, both of these sources of energy at the telephone stations have been done away with, thus bringing about a great simplification of the telephone set. The reason for doing this and the manner of its accomplishment may be the best understood in connection with the treatment of exchange systems. The telephone set was thus reduced to its lowest terms, both in regard to the kind of things comprised within it, and to the simplicity of its operation by the user.

Party Lines.

The simplest system of telephone communication is formed by two telephones permanently joined by a single line. While useful, the limitations are obvious. These limitations soon broke down under the avalanche of inventive effort that began with the introduction of the telephone, and that is still going on with ever-increasing vigor.

The first efforts toward making the telephone system available for communication between more than two points were in the direction of connecting more than two telephones with a single line. Thus arose what we now call the "party line," meaning, of course, the "multi-party line." Such an isolated party line, even when extended to its utmost capacity in point of the number of stations connected, can, at best, serve for communication between a limited number of telephones, only two of which may be used at any one time.

Notwithstanding these limitations, the isolated party line is still used, particularly in rural districts where the number of stations in a community are but few, or in other cases where a few stations of common interest are to be served. The isolated party line still seems the best practical solution for the inter-communication problem in certain pioneer rural districts where the settlers are so few and their combined resources so meager as to make a more elaborate system unavailable. It has formed the nucleus of many larger systems.

There are cases in the western part of the United States where a single telephone line runs through a narrow mountain valley, connecting the telephones of as many as 30 or 40 farmers. This, of course, is not the best form of telephone service; but it is a veritable boon to those who, without it, would often be almost completely isolated.

From this sort of thing, the so-called "farmer line service" has grown up. It is a troublesome and also an important factor of the telephone business: Troublesome because of the difficulty of affording ade-

quate service under difficult conditions at a price within the range of the patrons; but nevertheless important because necessary as a part of the larger conception of what telephone service should be.

(To Be Continued)

Indiana Telephone Men Honored by Telephone Pioneers.

Bancroft Gherardi, vice-president and chief engineer of the American Telephone & Telegraph Co., New York, was the principal speaker at a banquet given in the ballroom of the Columbia Club in Indianapolis, Ind., under the auspices of the Hoosier State Chapter, No. 16, Telephone Pioneers of America, which honored five of its members for long service in the telephone business.

Those thus honored were Curtis H. Rottger, president of the Indiana Bell Telephone Co.; E. T. Bonds, district commercial superintendent, South Bend; G. G. Hall, district commercial superintendent, Evansville; E. L. Taylor, manager, Fort Wayne; and J. G. Price, right-of-way agent, Indianapolis.

More than 500 members of the organization and their guests were present. Among the notables were J. S. McCulloch, president of the New York Telephone Co. and national president of the Telephone Pioneers of America. Five presidents of neighboring Bell companies were present as follows: B. L. Kilgour, Cincinnati & Suburban Bell Telephone Co.; Burch Foraker, Michigan Bell Telephone Co.; Ben S. Read, Southern Bell Telephone & Telegraph Co.; E. F. Carter, Ohio Bell Telephone Co., and W. R. McGovern, Wisconsin Telephone Co. H. O. Leinard, assistant to vice-president, A. T. & T. Co., also was present, as was F. O. Hale, vice-president, Illinois Bell Telephone Co.

Other speakers of the evening were Mr. McCulloh, F. A. Montrose, vice-president and general manager of the Indiana Bell company, and J. W. Hannon, general superintendent of plant, Indiana Bell, who is president of the Hoosier chapter. The entertainment committee was headed by W. M. Kendrick, outstate division traffic superintendent.

Texas Companies to Consolidate; Headquarters at Del Rio.

A consolidation of three Texas telephone companies, with a combined capital stock of $750,000, has been completed by the Del Rio & Western, the Laredo Southeastern, and the Trans-Pecos companies at Del Rio, Lytle and Sanderson respectively. Headquarters of the combination will be in Del Rio.

The new concern will have about 7,000 miles of toll pole lines among its facilities. Portions of West Texas, the Winter Garden district and the Trans-Pecos region will have a unified system. L. Rust, W. L. Boggess and J. V. Rucker are the incorporators of the new company which is to be known as the Del Rio & Winter Garden Telephone Co.

The Del Rio & Western had a capital stock of $300,000; the Laredo Southeastern, $150,000, and the Trans-Pecos company $50,000. To the combined capital stock of the three companies, there is to be an addition of $250,000, with incorporation as a $750,000 concern.

The Laredo Southeastern lines include those at Lytle, Encinal, Zapata, Hebbronville, Benavides and San Diego. The Trans-Pecos concern operated the properties at Sanderson and Marathon. The Del Rio company had facilities at Del Rio, Spotford, Vinegarone, Big Wells, Carta Valley, Rocksprings, Uvalde, Sabinal, Crystal City, Carrizo Springs, Asherton, Catarina, Cotulla, Gardendale, Brackettville and Eagle Pass.

The combined system will have connections with the Bell system at Cotulla, Laredo, San Diego, Sanderson and Uvalde.

The Trans-Pecos telephone concern was purchased from O. H. McAdams. J. A. Forman, who has been secretary of the Del Rio & Western and the Laredo Southeastern, was vice-president of the Trans-Pecos company. He will be secretary of the new company. L. Rust, who has been general manager of the Del Rio company and of the Laredo Southeastern, will be general manager, it is understood.

All three companies absorbed in the consolidation have been active in making improvements in their respective systems during the past two years. Extensive improvements have been made at Crystal City. A new building is under construction at San Diego and a building recently was completed in Hebbronville. A minor addition is being made to the Del Rio office building. No changes in rates or methods of operation are contemplated by the Del Rio & Winter Garden Telephone Co.

Gain in Telephones of Bell in Oklahoma During February.

There was a gain of 483 telephone stations in Oklahoma City, Okla., during February. This represented 63 per cent of the increase registered by the entire state, according to statistics compiled by the Southwestern Bell Telephone Co. The state gain for that month was 766 stations.

BETWEEN THE LINES

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

All daily newspapers are full of almost everything in the way of news. Not a day goes by that does not have some outstanding happening, such as murder, suicide, accident, or divorce. News of this sort is usually found on the front page under heavy headlines.

These headlines embody the gist of the story boiled down into startling, eye-catching, attention-holding phrases. The newsboys use them when lustliy crying out their papers.

Did you ever listen to these future captains of industry plying their trade? I have been listening to them all morning crying out a tragedy of a 20-year-old boy who was arrested, with a smoking pistol in his hand. And somehow that story has now woven itself into my article.

I often wonder if it is not the tragic news more than any other that creates a demand for the paper. When one hears the cry of "Extra!" he naturally runs to the window to hear, if he can, "what's happened!"

But it is not the headlines and the story below that grip my interest and yours. They are only the facts as found. What we would like to read, you and I, is the unwritten story between the lines. The reason for the deed, whatever its nature. How did it come to pass, that in his 20th year, this boy should be found standing in a dazed condition over his victim, with a smoking pistol in his hand?

What led up to this, dating back to the beginning of his brief span of years? Had he been given at least an even break by those who were responsible for ushering him into this land of the free and home of the blest? Who helped or hindered his growth up to the age of 20—parents; teachers; employers; companions? He had them all, no doubt, as has any other free and happy boy. If no one of these had failed him, would he be in the plight he is today? Don't you suppose he is thinking of some of these things now rather more than of what the future may have in store for him in the way of punishment?

We should all ask ourselves, occasionally, "What sort of an influence do I have in my contacts with daily associates?" I do not mean the influence resulting alone from known facts about us, but rather, "How do I influence folks as they read between the lines of what I do and say?"

A Little Trip to Brazil and Argentina

Interesting Story of a Trip to "Our Neighbors to the South," Which Gives a Very Enthusiastic Account of Sights Seen in South America—Some Observations on Industries, Education, Telephone Service, Sports and Opportunities

By J. D. Wilfley,
Division Manager, L. M. Berry & Co., Rochester, N. Y.

"See this world before the next." I had traveled east and traveled west, what about seeing our neighbors to the south, beyond the track of the sun? My good boss, Loren M. Berry, encouraged me; my good friend, Ernest R. Clark of the travel bureau of that name, made my arrangements, and on December 14 aboard the good ship Southern Cross of the Munson Line, we swung out into the Hudson, headed down the bay, and soon were "rolling down to Rio."

We neophytes had until December 31 to listen to the old-timers tell us all about the places, people, etc., we were soon to see. Everyone had quite a different story—and now here is mine.

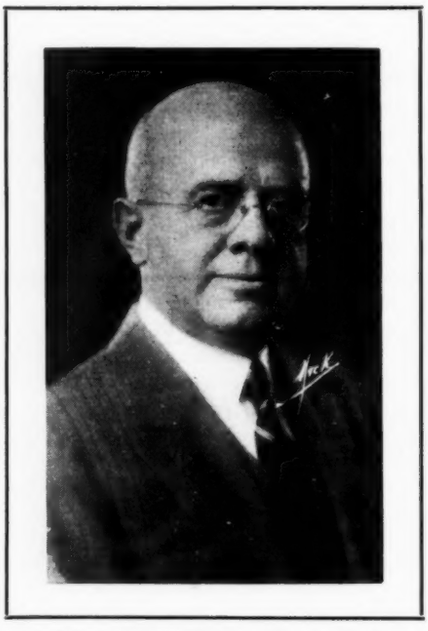
The crew, led by that gallant skipper, Captain Sadler, all the passengers and the sea itself behaved beautifully until old King Neptune boarded the ship as we neared the Equator—then pandemonium broke loose. All neophytes were duly warned, cautioned and commanded to appear before His Majesty's Court at an appointed hour.

What a memorable afternoon, December 23, 1929, will be for many of us. Just then, where and for what good this custom was inaugurated I have not learned; but since the bruises have begun to heal, we can look back upon the occasion as a lot of fun and feel quite distinguished with our diplomas of membership in the Mystic Order of Sea Urchins, properly framed and hanging on our walls.

The usual sport games aboard ship were carried on in a competitive spirit and prizes were duly awarded on Christmas Eve at the most enthusiastic captain's dinner ever held on a Munson steamer. Christmas day aboard ship as we neared Rio de Janeiro, we had warmer weather and also more freedom in enjoying our egg nog than did some of our friends back home. A sad and unique experience was the burial of a member of the crew at sea which took place at 10 a. m. Christmas morning.

At sunrise, December 26, we sailed into the beautiful harbor of Rio. Poets, painters and genii have failed to properly describe this wonderful place. Here Nature set up one of her best specimens of handiwork, and human hands have deftly built a city creditable to the setting; a bay almost filled with, as well as surrounded by, beautiful mountains, chief among them being the Sugar Loaf, Corcovada, Tijuca range, etc.

Rio de Janeiro is well and beautifully built and cleanly kept; broad streets and avenidas, tree-lined and set off by flowers, beautiful and plentiful. Our ship lay in port ten hours, and we spent a busy day motoring through the city, along the beaches, over the mountains and then took a cable car to the top of Sugar Loaf. More about Rio de Janeiro later, for we spent two weeks there on our return.



"For Men of Ability with Courage, Patience and Optimism," Says Mr. Wilfley, "I Recommend South America as the Most Interesting Opportunity of Any Place I Know."

Our next stop was at Santos, the largest coffee-shipping port in the world. It is said that they have enough coffee stored in warehouses there to supply the world's demand for five years. Santos is very hot, so we went up to Sao Paulo on top of the mountain to spend the night—very comfortable there. It is also a very beautiful, thriving, manufacturing city—called the Chicago of South America. An American motor company has just completed an assembly unit at a cost of $2,600,000, and many other American companies are operating in a similar way, which shows the confidence these people have in that country. Why shouldn't they? Such resources, such great possibilities are there.

Returning to Santos we boarded the ship for Montevideo, capital of Uruguay, the smallest and probably the richest country in South America. We spent the afternoon driving through the city and along the wonderful beaches. Many people from Buenos Aires and the Argentine go there for their summer vacation to enjoy the bathing, for it is much cooler there than in Buenos Aires. Uruguay is the only country in South America where they now license gambling. The casinos are owned and operated by the government.

We next sailed up the Plata river, an overnight ride to Buenos Aires, the capital of Argentina; also the largest city in South America. What a city! Three million population and growing rapidly. Well we might follow their plan of laying out some of our large cities—wide streets, lined with trees, well-lighted and decorated with much gorgeous statuary in the parks and along the avenidas.

One is immediately impressed with the modern business methods and progressiveness of Buenos Aires. The left-hand and reckless automobile driving is quite confusing and also disturbing, since it is quite generally rumored there that if the driver kills his victim, he goes free; if the victim is only maimed, the driver must settle.

Arriving in Buenos Aires on December 31, we hastily made reservations for New Year's Eve at the Armenouville Club, the largest and most popular one in Buenos Aires. The crowd was large and very orderly, the women most beautifully gowned. Dancing and entertainment was in full sway at 4 a. m. Then is when most of the better clubs close; chief among these are the Tabaris, Florida, Juliene, Maipa Pigall, Richmond Bar, etc. Some less reputable stay open all night.

New Year's day we went to Palermo, probably the greatest race course in the world. Here they have racing on every Sunday and every holiday throughout the year. South Americans are a great pleasure-loving people.

However, there is another life there. Such cities and businesses don't just happen. Let me say first that the representatives of our American companies in South America work harder than they do in a similar position at home. However, for men of ability with courage, patience and optimism, I recommend South America as the most interesting opportunity of any place I know.

Henry B. Orde, vice-president and treasurer of the International Telephone & Telegraph Corp., gave me a letter to Colonel

W. F. Repp, also vice-president of that company and actively in charge of operations in South America.

Colonel Repp bears a very enviable reputation, is a diplomat of the first order and as busy all year as our division plant superintendent in Rochester was for two weeks after the sleet storm last December. Colonel Repp and his worthy co-workers have real problems and plenty of them. They are doing a good job, and the telephone industry is progressing in a satisfactory manner throughout South America. I heard many people express appreciation of the improved telephone service and the extension of long distance lines. They are clamoring for more. Due to poor travel and transportation facilities, long distance telephone service is especially desired.

Since the International corporation has taken over the telephone company at Chile, I understand the traffic has increased considerably over 100 per cent. They are making some important acquisitions and extensions along the west coast, and are only waiting for some government approval of their purchase of the telephone company of Montevideo before starting to rebuild the plant in that city. The people of Montevideo are patiently abiding their time, as they really have poor telephone service now. No doubt the telephone company will have a large increase in business there as soon as modern equipment can be installed.

Increase in Business.

The telephone, banking, farming implements, machinery, automobile, drugs, refrigeration plants, packing houses, sewing machines, oils, livestock and agriculture are the big industries in Argentina, and all have enjoyed a large and increasing business in the last few years. Some of the European countries have more properties and investments in the Argentine than has the U. S. A., owing to the fact they have been operating there so much longer. It seemed to me that the Brazilians are more friendly and anxious to trade in the United States than are the people in Argentina.

There are about 40,000 resident British in Buenos Aires, a great many Germans and Italians and about 6,000 North Americans. The latter have luxurious clubrooms in the new National City Bank building. Games of most all kinds are greatly encouraged in Argentina; football ranks as the most popular, though polo, riding, swimming, boxing, golf, etc., all come in for a goodly share.

Education in Buenos Aires is free and compulsory. Children are required to attend elementary schools between the ages of 6 and 14. There are also many private, industrial and technical schools, as well as national colleges and universities, so that education there is on a par with most enlightened nations.

Just now the exchange on the peso is low, and fluctuates quite a little. Since Argentina must pay outside obligations in gold coin which is at a high premium, business is naturally somewhat depressed. However, I can see nothing except success and progress for Buenos Aires and the Argentine; the country is so vast and fertile, with the surface as yet only scratched. After spending ten busy days in Buenos Aires I took the River Steamship Line to Montevideo for a couple of days to visit friends and rest. The Americans in Montevideo are happy and think they have the best place in South America to live, which seemed to me true, at least in the midsummer time when I was there.

Description of Rio de Janeiro.

Rio de Janeiro is, however, the beauty spot of all places visited and I was glad to board the Southern Cross again bound for that port. We stopped at Santos long enough to load 64,000 bags of coffee, one of the largest shipments from there in years. The coffee brokers have decided to take their loss and clear up the bad condition that has existed there for some time. As a result, we are getting coffee much cheaper, with the prospect of its being even less.

Arriving in Rio de Janeiro I was met by friends with whom I had made the trip down and was driven to the Capacabano Palace Hotel facing the Capacabano Bay, where we find one of the most beautiful bathing beaches in Rio de Janeiro. The hotel is several miles from the heart of the city. The drive there, either along the broad avenidas or skirting the shore, is very beautiful. Few hotels in the world surpass the Capacabano in luxury, comfort and service. I enjoyed my two weeks' stay there.

Usually we went in bathing every morning and evening and spent the days visiting the shops on the Oñvidor and sightseeing along the Avenida Rio Branco. Spanish is the universal language spoken in Argentina; in Brazil, it is Portuguese. I prefer the Spanish, but speak very little of either.

Rio de Janeiro is the capital of Brazil and second largest city of South America. Brazil has an area of 3,275,000 square miles, the largest country in South America and fourth largest in the world. Brazil furnishes four-fifths of the world's coffee crop, is the second largest grower of cacao, produces much sugar, has extensive forest areas and mines of precious and semi-precious stones, big ones too. One diamond weighing 255 carats was sold for $400,000 in gold.

Many Butterflies and Snakes.

No country has quite so many butterflies; over 30,000 species have been found in Brazil. I wonder how many varieties of snakes? They seem to have failed to chronicle this. One very interesting place was the snake farm, near Sao Paulo. There they receive all kinds of poisonous snakes in great quantity, almost daily—and they take the poison to make a serum which proves an infallible cure for snake bites.

Golf has gained a great foothold in Brazil; but when your golf ball goes into the rough, you just let it go—after you have visited the snake farm. The drives in and around Rio de Janeiro are most beautiful. Those going up the Corcovado Mountain over the Tijuca range or to Petropolis and Therezopolis compare most favorably with the world-famous Amalfi drive from Sorento to Naples and the upper and lower Cornish drives along the Riviera.

Petropolis is a beautiful place, the summer home of the President of Brazil and his official family, as well as that of many of the elite of Rio de Janeiro. It is the place for the gay and smart society from December to April.

The gayest time of the year in Rio de Janeiro is carnival time, just before Lent. It is similar to our Mardi Gras in New Orleans, magnified many fold. Practically all business is suspended during the celebration, which continues several days and nights without interruption. This celebration is observed all over South America but much more elaborately in Rio de Janeiro than in the other cities.

Horse Racing in Rio de Janeiro.

The race course in Rio de Janeiro compares favorably with the Palermo in Buenos Aires. There is racing every Sunday and holidays and the races are always well attended.

Departing from Rio de Janeiro is like leaving Honolulu. Many of your friends are there to say good bye and wave to you so long as you can see them. So we left beautiful Rio, glad indeed to have been there and hoping to return at some early date.

The next stop was at Trinidad, a beautiful island off the coast of Venezuela. Port of Spain is the principal city. One noticeable feature there was the smooth, well-kept roads, surfaced with pitch from the pitch lake for which Trinidad is famous. Here we attended a cricket match between England's crack team and the Trinidad team. Such a match is held every three years. We had an interesting day in Trinidad, motoring along the beaches, over the mountains and through the banana and cocoa fields.

The next and last stop before reaching New York was at Bermuda. There we spent only a few hours, driving in a horse-drawn vehicle along the beaches to the National Aquarium, the most beautiful and interesting one I have ever seen. I wonder if there is a quieter or more restful place than Bermuda. The climate is nearly perfect, with an average yearly temperature of 70 degrees.

We reached New York 42 hours after sailing from Bermuda, and I was glad to get home. It was a perfect trip. I recommend it to you.

The Farmer and His Telephone Service

Discussion of Three Methods of Furnishing Farm Telephone Service by Local Exchange Companies—Experience Indicates That Exchange Company Should Own All Rural Lines—Address Before Convention of South Dakota Association

By J. C. Crowley, Jr.,
Secretary, Minnesota Telephone Association, St. Paul, Minn.

Of the total of the world's telephones, approximately 34½ million, the United States has approximately 59 per cent. Nowhere on earth is there the telephone development that is as great as that in our own country.

From the last statistical information at hand on the world's telephones, January, 1928, we find that the telephones per 100 population in the United States was very near 16, while our closest neighbor, Canada, shows a telephone development of approximately 13 telephones per 100 population. Next in order come New Zealand, Denmark, Sweden, Australia, Switzerland and Germany, having from ten to four telephones per 100 population, while all other countries are credited with four or less telephones per 100 population.

Again, when this statistical information is analyzed further, we find that nine of the largest cities in the United States have a development of over 25 telephones per 100 population; while in communities of less than 50,000 in population, the development is approximately 12 telephones per 100 population.

In this splendid development of local as well as the long distance or toll line service, we must agree that it has followed a well thought-out plan and policy, ably assisted by men and women of experience and ingenuity to meet the demands and problems of telephone communication in and between the larger cities and communities. Every man and woman who has contributed time or labor during the past 50 years in this work may feel justly proud of their accomplishments, even though their particular part may have been a minor one.

We must bear in mind that the giant locomotive is a helpless pile of iron and steel without the cylinder heads, the pistons, the steam, the lubrication, water rails and the road bed—all must do their part. I fully realize that those in attendance here are not as deeply interested in the problems of serving communities of 50,000 or more, as you are in serving communities of 10,000 and much less.

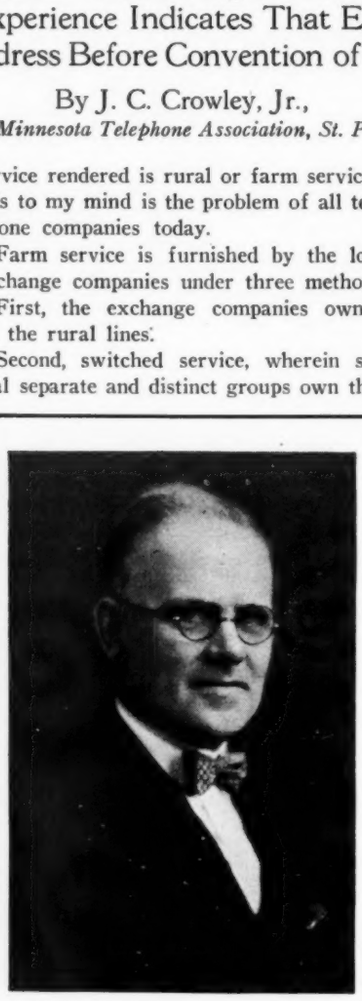
I have submitted the foregoing for your consideration, so that you may figure your own problem as to what is the average number of telephones to the 100 of population that you serve.

I venture the statement that if you eliminate the ten largest cities of your state, the balance of all your exchanges will show that 60 per cent or more of the service rendered is rural or farm service—this to my mind is the problem of all telephone companies today.

Farm service is furnished by the local exchange companies under three methods:

First, the exchange companies owning all the rural lines.

Second, switched service, wherein several separate and distinct groups own their own lines. In some instances, we have as many as 20 or more groups connected to one exchange.



Farm Telephone Service, Mr. Crowley Declares, Should Be Supplied Over Lines and Equipment Owned by Local Exchange Company.

Third, the rural telephone company operating all of the rural lines radiating from the one or more exchanges.

From my point of view, based on experience, the first of these methods is the preferable one for all concerned, if the community is to receive a reliable, efficient and courteous service, for the responsibility for the service of that community is upon the one management or organization. Under such an organization, standard methods of construction, maintenance and traffic may be adopted to meet the particular requirements of the community in which it operates.

The objection to the second method mentioned is that switched service is, first, a division of responsibility for the construction and maintenance of the line, as well as the variety of various types of substation equipment connected to these lines. I know of some of these companies operating almost as many types of substation equipment as there are subscribers on their lines; and many of them are of the vintage of 1896 up to the 1916 models.

In most instances, these lines are repaired by some individual who is selected or nominated at the annual meeting, which is usually held by these companies for the primary purpose of ousting the old officers and directors and giving a new crowd a chance at telephone management, regardless of the ability or time and expense contributed by the former board of directors or officers.

In the majority of cases with such companies, there is no maintenance of the lines. The repairman is only called upon when the line is down, or when some individual has succeeded in taking the telephone apart to replace a receiver or transmitter cord and finally acknowledges that he can't get the "darn thing" together again. Each farmer usually provides his own batteries. This is one of the contributing causes of poor transmission.

The only funds provided are ordinarily obtained by assessing each member for an amount that will barely cover the actual costs of repairing the line during the year.

In many cases these lines and equipment have been in service 20 years or more. In most cases the wire life is gone, and the poles rotted to a point that it is dangerous to life and limb to attempt to climb them for ordinary repairs. Many of these lines should have been rebuilt three to five years ago. But, there are no funds available for this purpose; and the great difficulty is that in most cases the majority of the original incorporators of these lines have either passed out of this life, sold their farms or retired to the villages.

These farms now being in the hands of new owners or tenants, the minority, or those remaining, of the original stockholders are unwilling to make an additional investment of two or three times the original amount put into these lines, due to the increased costs of labor and materials. On the other hand, the new owners or successors on these farms do not care to assume the liabilities of a copartnership in a worn-out property, and are fearful of any investment in such enterprise, as they have the experiences of their neighbors to refer to.

As to the tenant, he is not interested in investing anything towards the restora-

tion of the line, for he does not know how long he will be a resident of that community.

Where a condition of this kind confronts you, I would advise the telephone manager or owner to purchase the line at its reasonable fair value, stipulating in the bill of sale that the sellers agree to pay a monthly rate for service rendered, which will assure to the purchaser a reasonable return on the purchase price plus the investment necessary to rehabilitate the property, over and above the costs of operation, maintenance and depreciation.

An exchange company serving these switched lines not only furnishes the traffic service and that part of the facilities necessary to carry their lines from the city or village limits to the switchboard including central office equipment, but wherever these lines parallel or cross under existing power transmission lines, assumes a hazard and liability endangering the lives of its employes and a serious loss of property. This is due to inexperience and lack of knowledge of those usually employed by such farm line companies in standard methods of construction and maintenance in the vicinity of such power or transmission lines.

Exchange Company Criticized.

In the majority of cases when one of these lines is reported out of order, invariably the exchange company is criticized by its patrons as to the unreliability of its service, even though the fault is beyond the village or city limits, and the location of such trouble has been ascertained by test made at the test pole or point of contact of both lines.

So, under this switched farm line service connections, the exchange company, no matter how well its plant may be constructed or maintained, no matter how efficient and courteous its operators may be, if it has connected to its exchange one or more of farm lines neglected as just outlined, eventually has its entire service subject to criticism.

Under the third method of rural service —where the farmers own all of the rural lines radiating from the central office under one management—in the majority of cases a fairly good job is being done. This is due to the fact that in these cases an experienced man is usually employed on full time for repairs, and at certain seasons of the year additional help is provided for several weeks on maintenance, repairs, and replacements.

In many instances of the switched lines to an exchange, if they would merge their various lines into one group, such as the third method mentioned, they could employ a full-time competent man and be assured of a reasonably adequate service.

Please do not misunderstand me. I have no objection to the farmer being in the telephone business. He has the same privilege of being in this business as the average business or professional man has of owning a farm, only the telephone business has not been as expensive to the farmer as the farm has been to the business or professional man.

I do want to impress upon the farmers in the telephone business that no longer can they say, "This is good enough." I believe it is the duty of every one employed in the industry to call the farmers' attention to the fact that the telephone business is becoming more and more an engineering problem, and one that demands experienced supervision and management, if their particular property and the community that they serve are to enjoy the full benefits of telephonic communication with the rest of the world.

Install Modern Apparatus.

This can only be had by retiring all obsolete subscribers' station equipment and substituting therefor modern apparatus; replacing all iron wire that has been in service 15 or more years; establishing a maximum of not to exceed 12 subscribers per circuit; abandoning as soon as possible the grounded or single-wire line and metallicizing all circuits.

I know this will create some discussion, but let me call your attention to the fact that a recent survey of the United States showed that the total farms served by electric energy numbered slightly over 550,000 at the end of 1929, and will probably increase to 1,000,000 during the next four years; and during the past four years, 150,000 miles of transmission line to serve rural customers have been built, and an equal amount of pole mileage extensions is proposed for the next four years.

Whenever these transmission lines are extended, paralleling an existing grounded telephone line, such telephone line must be made metallic and properly transposed to overcome the inductive influences created by such transmission line. Not only does this mean that two new wires must be placed, but additional poles must be placed to shorten the spans so as to avoid continual crosses or conflict between these metallic circuits.

Then again, a much higher type of maintenance must be followed, and the telephone line must be kept highly insulated and free from all trees and grounds if the inductive influences of the transmission lines are to be kept at a minimum.

With the extension of these power and transmission lines throughout the rural districts, one can readily appreciate that such extensions are a contributing factor in the increased costs of rural telephone service.

Switched Line Service Charges.

The schedule of rates for switching service in various exchanges throughout our several states may be compared to the well-known nationally-advertised food products; they are of "57 varieties," ranging from $4.20 per annum to $18.00 per annum per telephone.

I am informed that the switching rate in South Dakota is established by legislative act at a price much lower than any of the figures quoted. If that be true, may I suggest an amendment to your present tax laws that all telephone companies serving such switched lines at this so-called lawful rate, be entitled to an exemption of $3 to $5 per telephone for every telephone so served, and the total of this amount be deducted from the gross amount of taxes due the state. This would be far more equitable than charging the difference in cost to the limited number of subscribers or stockholders of any one community.

A number of studies made as to the costs of switching service at various sized exchanges shows that it costs from $6.20 to $10.70 per annum to render this service. Why should it be furnished for less than cost?

Small Exchanges.

In some communities we find small exchanges at distances of five to seven miles apart that are barely existing, due to the limited field of operation, all owned and operated by separate interests, and each community jealously proud of its own central office.

Usually such offices render a limited service of from 12 to 14 hours per day and a few hours on Sundays and holidays.

In most cases of this kind I predict it will be a case of the survival of the fittest; but the communities that they serve in the meantime are suffering for want of an efficient and reliable service, and will continue to suffer until such time as those whom they serve protest, or the present owners decide to abandon their field to their neighboring company.

How much better it would be for all concerned if a consolidation of interests were agreed to and two or more of these exchanges were combined to eliminate one or more offices. This would broaden the field of operations to the remaining company and would permit that company to give a 24-hour service, seven days a week. After all, telephone service is not service unless that service is available any hour of the day or night throughout the year.

Objectors to Rate Increases.

It has been my experience in presenting rate cases before regulatory bodies, that the most serious objection comes from the rural subscribers; notwithstanding that that same rural subscriber has been enjoying service at a rate out of all proportion to the village or town subscriber.

Let me make myself clear: If we consider the capital investment in the average village or town exchange, and segregate the physical property and central office equipment used and useful to the village system from that part of the property serving the rural subscribers, including that portion of the village system and that portion of central office equipment used and useful to the rural system,

I have yet to find a single instance where the investment per station on rural lines is not from one-third to three times greater than the village system investment per station.

I do not blame the majority of the rural subscribers who protest in some of these rate cases presented, when one considers the conditions in some of our rural communities; but I do most emphatically object to the individual or company filing an application for an increase in rates without first having fully advised everyone of its patrons of the reasons and necessity for such increases.

Upon investigation of some of the cases where increases have been approved and the subscribers in protest have discontinued their service, I am of the opinion that had the owner or management of the company presented the facts to all of its patrons in a clear and easily understood statement prior to the application, very little opposition would appear.

In this I do not want to be understood that any rate case may be presented without any objectors for I came to the conclusion some time ago that objectors to increases in rates of our public utilities will, as the good book says about the poor, always be with us.

Where an owner or company has had trouble, in such cases, to my mind, they have failed themselves to analyze their own situation as to causes and necessity for additional revenues to meet the changing economic conditions. They have failed to realize that the present generation is demanding a higher type of service.

They have failed to realize that public demands have created a necessity for increased capital investment. Among some of these demands may be mentioned the "white way" along the village street, which has cost the telephone companies thousands of dollars in the retirement of property; and the placing of new distributing systems. Public highway improvements have cost the telephone companies thousands of dollars.

Minimum wage laws have cost thousands of dollars; increased taxes, and many others, but time will not permit more under this head.

They have failed to realize and advise their patrons of the increased cost of materials, supplies and apparatus, and the transportation cost increases in the delivery of these materials, supplies and apparatus, as well as the wage increases.

In conclusion, I have heard some of my rural friends say: "Never mind, you will keep on increasing these rates until the government goes into the telephone business." That would be unfortunate for both the telephone companies as well as the subscribers; but, to my mind, more so for our rural subscribers. Our neighbors in Canada in the provinces of Manitoba, Saskatchawan and Alberta have government ownership. Let me quote their charges:

In the smaller exchanges served by magneto telephones, $32 net per year. In the secondary group of exchanges served by automatic or common battery, $34 net per year.

These are all served by full metallic lines with selective ringing and a limit of ten subscribers to a line.

The Manitoba government will construct rural lines on a basis of one subscriber per mile. Any further extension is paid for by the subscriber. The subscriber pays the telephone system for any poles required on his own property. The government will place these poles at a fixed cost of $5 per pole.

In addition to these rates, there is a service connection charge applied, to cover the cost of wiring and installation of the telephone, of $8.00.

Rural subscribers owning their own lines—or what we term switched subscribers where the subscribers maintain their own lines—up to 70 subscribers pay $6 per year net; 70 to 200 subscribers $8 per year net; over 200 subscribers, $10 per year net. Compare these rates with those of your own and neighboring states.

At the beginning of this paper I gave the telephone development of the larger communities and called attention to the rapid development of the long distance business. I believe you will agree with me that this development did not take place without time and effort on the part of those whose business it was to improve, extend, and also create a demand for that service. This development, to my mind, was brought about largely through the splendid publicity and advertising campaigns supported by the larger companies.

And, I believe the smaller operating units should combine their interests in a publicity campaign throughout each state. Assemble the facts as to the necessity of the service, its protection, its labor-saving and its ever-depending link in making everyone neighbors throughout the state and nation; and when you have done this, see that these facts are given proper publicity through your daily papers, farm magazines, and orally at your county fairs and other rural assemblages.

When this has been done, the smaller exchanges and the communities will show a much better development, and have an increased demand for a higher type of service, with a willingness on the part of those that they serve to pay a rate that will warrant any capital investment required to meet these demands.

In closing, may I suggest to you owners and managers of the smaller properties, that you place confidence in the officers of your association and members of it. Ask their advice and counsel in your problems. If you are suffering from any of the ills that I have mentioned, you may rest assured that you will receive the benefit of their knowledge and experience towards the solution of your problem.

One of the Best of the 24 Conventions of the North Dakota Telephone Association Was Held in Grand Forks, March 11, 12 and 13.

Business Summary of Telephone Field Shows Gradual Increase.

A summary of business conditions issued by Julius H. Barnes, chairman of the National Business Survey Conference, March 23 states that telephone construction expenditures in January were 25 per cent in excess of corresponding expenditures in January, 1929. There has been a good start on the capital expenditure program of $700,000,000 of the Bell system, comparing with $633,000,000 total for 1929.

New installations of telephones in January and February were below expectations, but preliminary reports for March indicate improvements in volume. Long distance telephone business, although below expectations, shows an increase of 3 per cent in January, 4 per cent in February and 5 per cent in March at the time the report was issued.

Here and There in Telephone Work

Leather Directory Cover Introduced by Pacific Company.

In the interest of improved directory service, the directory department of the Pacific Telephone & Telegraph Co. in San Francisco, Calif., has designed an attractive detachable cover for use at public pay stations, in place of the heavy cardboard back directories formerly used for such protection purposes.

The new cover, which was placed in service with the issuance of the November, 1929, Bay counties directory, is of beautiful red Spanish leather or fabrikoid. Artistically embossed in gold are the words "Telephone Directory" and the Bell emblem. The directory is held in place in the binder by a special locking device which opens with a key at the lower end of the binder.

Public stations in the Bay, Coast, and Inland divisions have been fitted out with these directory covers, the Pacific Telephone Magazine states. They improve the appearance of the public stations and add greatly to the serviceability of the directories. The use of these covers will also effect a substantial annual reduction in directory replacement costs.

It is anticipated that as a result of installing detachable covers at public stations, there will be a demand on the part of customers for similar attractive, attachable directory binders. In order to meet the demand, a number of the binders have been made available for sale to the public and employes at cost. They are the same as the binders used at public stations, except that a wire rod directory holder is used instead of the locking device.

In order to improve the appearance of the directories furnished for directory libraries at attended public stations, a few of the detachable covers were equipped with a slotted bar at either end, thereby making it possible to insert several wire rods. With this multi-rod type of holder, it is possible to place from one to five directories with suitable indices in each binder, the number in each binder depending, of course, on the size of the directories involved.

These binders are placed in an upright position at directory libraries. Where the library requires less than ten binders, a flat-top table and suitable book ends are used for displaying them. Libraries having over ten binders in use are equipped with directory stands for holding the binders. Each binder has a bakelite strip fastened to the outside bolt, so worded as to indicate what directories are contained in the binder.

New Directory Cover of Red Fabrikoid Embossed in Gold Used in Some Public Stations of Pacific Telephone & Telegraph Co. Directory Is Suspended by Means of a Chain Plate in Preference to Long Chain Formerly Used.

The former method of suspending stiff-covered directories from both walls by means of a long chain has not been entirely satisfactory, and the directory department has developed a new type of hanger or chain plate made from cold rolled steel, nickel-plated. The chain plate is six inches long with a five-inch slot down the center, containing a lug with three links of chain to which the detachable cover is fastened.

By placing the chain plate on the booth wall in a perpendicular position with the bottom of the plate 52 inches from the floor, it is possible for customers ranging in height from four to seven feet to consult the directory readily without the slightest inconvenience. The new hanger presents a neat appearance, is not as rough on a directory cover or booth walls as a chain hanger, and assists in supporting the directory while in use.

The placing of this new directory equipment in service has been the cause of many complimentary remarks. One drug store reported that the directory

Added Convenience in Consulting Directories of the Pacific Telephone & Telegraph Co. Is Found Through the Use of New Equipment in Public Stations and Directory Libraries. The Chain Plate or Hanger Assists in Supporting the Directory While in Use. The Public Station Patron Finds the New Arrangement Very Convenient—At the Right, the Use of the Attractive New Covers in Directory Libraries Is Illustrated. Each Binder Has a Bakelite Strip Fastened to the Back on Which the Names of the Various Directories Are Printed for Easy Reference.

had been in service three weeks without change. Formerly it had to be replaced every three days.

The Magneto Exchange Repairman; Phantom Circuits.

By John A. Bracken.

On two rural metallic telephone lines, well balanced electrically, it is possible to obtain a third circuit without the use of additional line wires. This third circuit is called a "phantom." The use of phantom circuits is one of economy, it being possible to hold three independent conversations simultaneously over two metallic lines. It is found that the added apparatus in the central office is more economical than an additional pair of line wires between two exchanges. This reasoning is, however, modified to a great extent by other conditions.

The phantom is an imaginary telephone circuit virtually created by means of very carefully-constructed repeating coils—commonly called phantom coils—placed in the two line circuits at the central office.

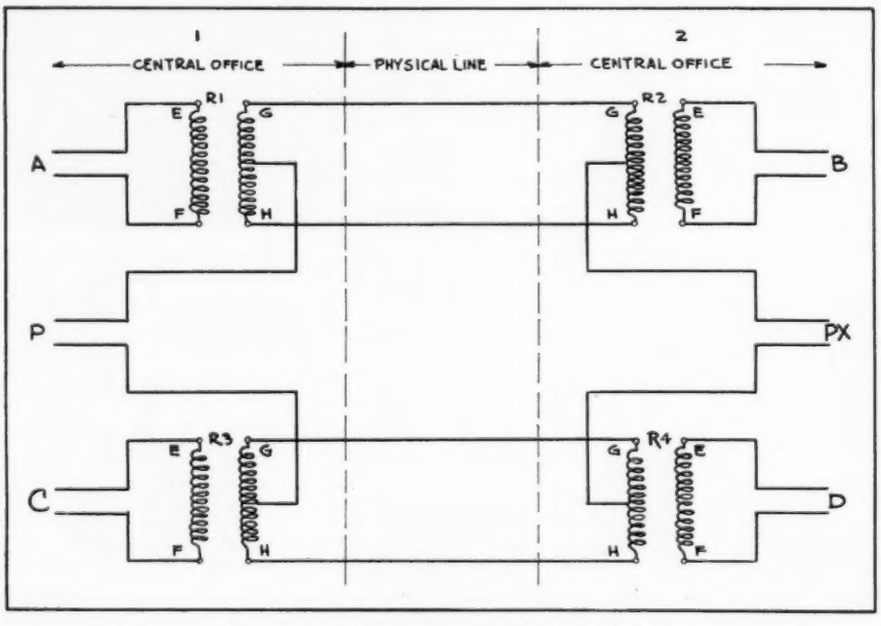


Fig. 1. Theory of the Phantom Circuit.

Fig. 1 shows the theoretical arrangement of a phantom circuit as follows: If a phantom coil is inserted in each end of a rural line, AB, as shown at R_1, and R_2, and two other phantom coils in the line, CD, at points adjacent to R_1, and R_2, as R_3 and R_4, and two wires are connected from a middle point of the coils, as shown running to P and PX, three telephone circuits may be established over the four line wires.

In such a circuit, voice currents flowing over the physical circuit AB or CD will not affect P and PX; also a voice flowing over P and PX will not affect the physical circuit, AB or CD, as the current through each phantom coil divides, half flowing in each direction.

Further operation of the phantom circuit may be explained as follows: Since the electrical current due to a voice is alternating and of various frequencies, the direction of flow will, of course, reverse every phase (the fractional part of a period or the time occupied in performing a complete cycle) of the cycle. That is, at one phase value the current increases until it reaches the maximum, then decreases until it reaches minimum value.

This current flows through the primary winding of the phantom coil and induces in the secondary winding a current in the opposite direction. Since the coil is designed for a one-to-one ratio, the induced current will be practically equal to the primary current. While the current flows in the primary winding circuit from E to F, then the induced current in the secondary winding circuit flows from G to H, and when the current changes direction, the reverse occurs.

There is some point in the secondary winding of the phantom coil (and primary also) which is always at the same potential, namely, zero; that is, there is set up equal and opposite E. M. F.'s in the other windings of the coil, and no current will result. This is the half-way point, with reference to the induction between E and F, and its value is the same, no matter which way the current flows. It is to this point that the phantom circuit, P and PX, is connected.

It is also possible to obtain two phantom circuits from four physical circuits, and by properly connecting the two phantom circuits, a third phantom can be obtained, thus having four physical circuits and three phantom circuits. This latter system, however, is very seldom established, for the complexity incurred in the transposition arrangement is great.

Certain requirements relative to phantom circuits in practice are very important. These are:

(1) The four wires comprising the physical line circuits must be of the same material, gauge (size) and length.

(2) The four line wires must have the same electrical resistance and leakage. If the two line circuits are of iron wire, a difference of resistance may be due to one of the lines being much older than the other. Poor connections in the line wires, etc., may cause difference in resistance. Leakage usually results from one or more of the line wires coming in contact with trees, guy wires, other wires, laying on crossarms, etc., thus permitting the electric current to escape to the earth at some weak point along the line.

Lightning arresters or protectors containing dirty carbon blocks may cause leakage.

(3) The four wires of the line circuits must be properly transposed with respect to each other; that is, the position of the line wires is changed at regular intervals in order to expose both sides equally to disturbing sources of E. M. F., thereby preventing crosstalk between the phantom and physical circuits. The phantom and physical circuit are also transposed against other circuits in the same lead.

Automobile Ignition System Cause of Noise on Ocean Telephone.

Nature, with her cracking static, is not the only obstacle that confronts the engineer in making it possible for the human voice to span the seas—but the well-known automobile has had to be taken into consideration in removing the foes of radiotelephony, according to Ralph Bown, a member of the department of development and research of the American Telephone & Telegraph Co.

Mr. Bown in a recent paper before the American Institute of Electrical Engineers on "Short Radio Circuits, Transmission Features of Circuits Used in Transoceanic Telephone Service," pointed out that in talking across seas, the automobile, racing up and down some of the coastwise highways, interfered with conversations across vast spaces, until they found out what was wrong and eliminated the cause.

Mr. Bown had this to say of how the flivver and other cars furnished their share of trouble:

"There is one other type of noise than that provided by Nature which is of particular importance at short waves—electrical noise from the devices of man. One of the worst offenders is the ignition system of the automobile. The short-wave transoceanic receiving station at Netcong, N. J., is so located that automobile roads are at some distance, particularly in the direction from which reception occurs. Service automobiles, which produce interference, cannot be allowed near the antenna systems, unless their ignition systems have been shielded."

Toll Telephone Operating Methods

Operating Methods Are Designed to Provide Good and Rapid Toll Service and to Assist Telephone Companies in the Operation of the Business—Need For Improved Transmission Increasing—Address From New York Annual Convention

By Miss Nina R. Allen,
Division Traffic Agent, Eastern Division, New York Telephone Co.

You are all familiar with the operators' "Book of Knowledge," more properly referred to as "Toll Operating Practice." It is a compilation of methods based upon the result of experience and experiments, and is designed to the end of producing the best telephone service available today, yet it is issued in a loose-leaf form because it is the best only for a day.

Today's and tomorrow's needs and experiences will necessitate eliminations, additions and changes, and it is probable that your experience or the suggestion of some co-worker will be a determining reason for these changes, and when they are developed they will be promptly made effective.

Toll operating methods have been designed with a view to obtaining good service and efficiency of operation by uniformity of operating, a rapid speed of service, accuracy, good transmission and a most efficient use of toll switchboard equipment, toll circuits and operating labor.

Uniformity of operating originally only concerned us in the dealings of one office with another; that one office could understand the other, that an interchange of operators could be made and the offices still function. With changes in conditions, this feature has taken on a broader aspect, and it now, more than ever, affects the subscriber's service.

The subscriber travels more, he files his calls in many different places, and he notes a difference, if any, in recording, in the questioning phrases, and the voice work. With a great proportion of C. L. R. traffic, the subscriber is on the line to hear the operating over the circuit and the response of the distant office, the standard handling in phrases and clear repetitions over the circuit which makes him feel that his call is going forward promptly and accurately.

In recent years the introduction of C. L. R. service has given us a method to give a very rapid speed of service. It has cut the elapsed time from the filing of a call to the start of conversation or a definite report, from eight minutes to about two minutes over the system. The recent introduction of the multi-switch practice is designed to improve the speed of service on the more difficult built-up traffic in somewhat the same proportion.

However, rapid as this service may seem on the average, much remains to be done to improve even the above speeds. For example, one major item of traffic in some localities—that is, traffic from tributary offices—is not receiving this speed, due to non-standard handling, for various reasons, to the toll center.

There are other conditions which tend to hold this speed as high as it is; that is, the volume of address name calls filed, and a faithful repetition of the number received from the distant office to the calling subscriber will tend to cut down this amount of traffic. Offices having no bulletion of points that may be reached by C. L. R. may be provided with them and the existing bulletins in many offices may be enlarged and brought up to date to cover the introduction of new circuit groups and routings.

One of the measuring sticks that the subscriber uses in judging whether his toll call was satisfactory, in addition to the speed, is whether the call reached the proper party or number under the proper rate classification. All the phrases of recording and advancing the call are designed to this end.

Another measure to the subscriber of his service is how well he can hear and be heard on his call. The entire toll board method is interwoven with practices to protect this feature of the service from the selection of the proper route and circuit, the passing of the order to the distant or intermediate office, and the writing of poor transmission tickets, if the quality of the conversation requires it.

Recently the practice of specifying whether a repeater is required or not was written in the practice to insure in all cases the introduction of repeaters when required. A feature of the practice which there is a tendency to slight or omit entirely, is the writing of poor transmission tickets. These should be faithfully written by the traffic people and acted upon by the plant section, in order to insure that all cases of poor transmission be remedied as soon as they are observed.

This feature cannot be over-emphasized, as the need for improved transmission is constantly increasing. Some years ago when the subscriber waited an average of seven or eight minutes for a call to be completed, this delay in itself suggested difficulties. At the present time the majority of toll calls are going up with the subscriber at his telephone and with a speed approaching that of local service. What happens after the connection is actually established, may be a controlling factor in the subscriber's judgment of our toll service.

In addition to providing good and rapid toll service, operating methods are designed to assist the telephone companies in the operation of the business. To handle toll business requires a switchboard, expensive toll circuits, and operating labor.

The methods of handling the traffic, if carried out naturally, assist in keeping the use of these expensive items at their topmost efficiency and do not force the additions of switchboard equipment, or people to cover poor operating conditions.

In reality, we are highly specialized salespeople, selling an exclusive service to a critical and, generally speaking, an appreciative public. In other fields, whether they be investments, real estate, insurance or merchandise, the big salesmen are the ones who make good against opposition. They are kept at their best by sales conferences, while we are being constantly brought up to the best that experience and experiments have developed by means of toll operating practice.

Texas and Montana Subscribers Like "Telephony."

"Enclosed please find my check to extend my subscription to your journal," says E. D. Selmser, of Freeport, Tex. "It seems ages ago since I started to take TELEPHONY. Wherever I go the old standby follows me, and I would be lost without it, as I refer so much to it. The small sum for a subscription to TELEPHONY surely brings back a big interest on the investment."

From Worden, Mont., W. F. Fricke writes: "Enclosed find money order to keep TELEPHONY coming. It's the best help I've got."

Oklahoma Association Has Successful Annual Meeting.

About 1,100 public utility executives and employes attended the 12th annual convention of the Oklahoma Utilities Association at Tulsa on March 11, 12 and 13. Attendance included representatives of the electric light and power, gas, electric railway and telephone utilities and manufacturers and suppliers of gas, electric, telephone and safety equipment.

W. O. Mills of Skiatook, of the Standard Telephone & Telegraph Co., was elected chairman of the telephone division

The Monophone is avai *in all* *black models, but in at* *well* *These are Chinese red,* *green* *maroon, orchid, old* *and* *walnut, with either chro* *plated* *ttings. Send for descrip*

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A careful examination of the Monophone reveals the reasons for its extraordinary durability. In its design, projecting points have been reduced to a minimum, and those that are necessary have been made especially rugged. Points of stress have been scientifically reinforced by incorporating metal parts in the mould—so that unusual strength is secured without sacrificing lightness. The compact construction of the Monophone, together with the heavy base with low center of gravity, make it virtually impossible to tip over.

In all, the Monophone is an exceptionally sturdy and durable mechanism, with unusually long life—and as such is being adopted by hundreds of progressive telephone organizations, who believe that their own profitable future is assured only by giving their subscribers nothing but the best.

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of the association. The board members are: Samuel Hand, of the Beggs Telephone Co., and L. K. Miles, of Garber, Western Telephone Corp. of Oklahoma, the latter to fill the unexpired term of J. M. Nelson of Oklahoma City, who has left the telephone business.

Thos. R. Weymouth, president of the association, in his annual report, stated:

"There were in Oklahoma at the end of last year 572 telephone exchanges, of which 153 were owned and operated by the Southwestern Bell Telephone Co. and the remainder by the Independents or connecting companies. There were at the end of the year approximately 307,000 telephones in the state. There are, at the present time, nearly 1,000,000 miles of long distance and local wires, or sufficient mileage to reach around the earth 40 times.

"A network of toll or long distance telephone lines connects nearly every town and rural community in the state. Oklahoma completes approximately 625,000,000 telephone calls annually. Oklahoma telephone companies employ more than 6,500 people and the list is growing steadily.

"Independent telephone companies constructed several thousand miles of new toll and exchange lines and erected or remodeled many exchange buildings. The Southwestern Bell company expended more than $8,000,000 on improvements and extensions to its properties.

"One of the greatest new developments of that company in Oklahoma during the past year, and one which would be notable in any state, was the beginning of a $5,000,000 underground cable construction program. The company completed an underground cable line from Oklahoma City to Holdenville at a cost of approximately $1,000,000 and started work on a similar line between Oklahoma City and Tulsa to cost a similar amount.

"Other principal cities will be connected by these underground cables until the $5,000,000 program in the state is carried out. This is a part of a $50,000,000 underground cable construction enterprise of the Southwestern Bell Telephone Co. in the five states under its jurisdiction. The company also constructed several thousands of miles of new toll lines and has made substantial improvements in its properties in nearly every city and town which it serves.

"While no reliable estimate is available on the total expenditures of Independent telephone companies in Oklahoma for the past year, their activities indicate that they also have been alert in extending and improving service."

The report of E. F. McKay, manager of the association, stated that the Independent companies in the state, as well as the Bell, were making plans for the improvement of telephone facilities. He said in part:

"A notable accomplishment of the past year in the Independent field was the installation of an automatic telephone exchange by the Oklahoma Telephone Co. at Broken Arrow. This is the third automatic system in the state, the others being at Oklahoma City and Tulsa where the Southwestern Bell company has the dial system in operation.

"The Standard Telephone Co., which operates a number of exchanges in northern and northwestern Oklahoma, has made provision for an extensive improvement program throughout its territory, including the section of Oklahoma where it operates, comprising Harper, Beaver and Ellis counties."

A number of propositions were given attention by the association in the interest of the telephone industry during the year. One of these, involving ownership of telephone facilities in hotels, is the subject of wide divergence of view by the several interests concerned, Mr. McKay stated, and an ultimate agreement satisfactory to all parties is not certain. Through interest manifested by state and national hotel men's association this question has taken on a general phase.

In an address before the telephone division, R. G. McCurdy, Kansas City, Mo., manager technical department, Graybar Electric Co., said that, "Indications are that more attention will be paid in the future to the commercial advantages of daylight broadcasting." A number of broadcasting stations are operating at increased power in the daytime and with no night transmission periods, he stated. This is due to the feasibility with which radio receivers may now be operated by women in the homes at the time they are performing their housekeeping duties, or resting, he said.

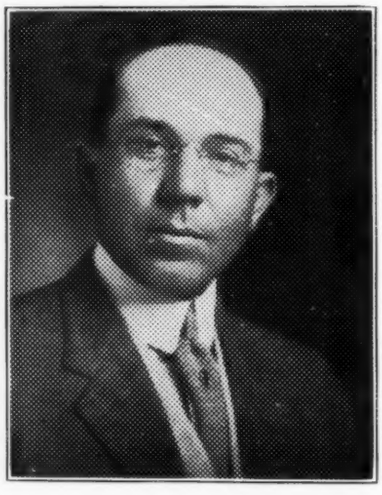
Personal Notes from the Field

Carl D. Brorein, vice-president and general manager of the Pennisular Telephone Co., Tampa, Fla., was renominated for president of the local chamber of commerce at its recent annual meeting. When the name of Mr. Brorein for renomination was presented by Major McKay, the meeting rose spontaneously to its feet in expressing approval. The election will take place April 1.

There was a record attendance at the meeting, over 450 being present. The history of the past year under Mr. Brorein's leadership shows a record of accomplishments, of tangible public improvements and valuable contributions to the general prosperity of the community.

E. O. Turner, formerly vice-president and manager of the Missouri Telephone Co., at Centralia, Mo., resigned his position, effective March 1, 1930, and has purchased the Citizens Telephone Co., of Fredericktown, Mo., which has about 700 stations.

Mr. Turner, well and favorably known in Centralia, has been in telephone business



E. O. Turner, a Pioneer Missouri Independent Telephone Man, Has Purchased the Plant at Fredericktown, Mo., and Is Now Operating It.

since 1902 and has owned and operated plants at Scottsville, Ill., Tarkio, Pattonsburg and Gallatin, Mo. He went to Centralia in July, 1926, and shortly thereafter purchased the Home Telephone Co. Later the Missouri Telephone Co., comprising the exchanges of Centralia, Clark and Sturgeon, was organized. The plants at Macon and Columbia were acquired, and last year they were consolidated under one management and the executive offices of the company moved to Columbia.

Since his connection with the Missouri company Mr. Turner has filled the position of vice-president and has been manager of the Macon exchange along with the Sturgeon and Clark exchanges. He intends to make many improvements in the plant at Centralia.

Mr. Turner is active in Masonic order and the Rotary Club.

L. O. Painter, chief engineer of the Tri-State Telephone & Telegraph Co., St. Paul, Minn., was honored by election to the vice-presidency of the Minnesota Federation of Architectural and Engineering Societies during its convention in Duluth, Minn., February 14 and 15.

Mr. Painter has been in the telephone field for 22 years. His earlier efforts were

directed towards the construction of telephone plants in various cities throughout the United States and at least two in Canada. Among those in the building of which he took an active part are included

L. O. Painter, Chief Engineer of the Tri-State Telephone & Telegraph Co., St. Paul, Minn., Was Recently Elected First Vice-President of the Minnesota Federation of Architectural and Engineering Societies.

plants at Lincoln, Neb., Houston, Tex., Dallas, Tex., Buffalo, N. Y., Indianapolis, Ind., Lorain, Ohio, Hazelton, Iowa, St. Paul and Minneapolis, Minn., Edmonton, Alta., and Regina, Sask., Canada.

For two years he was engaged in general maintenance work at Van Wert, Ohio, and was for 11 years with the Automatic Electric Co., Chicago. While with the Automatic Electric Co., Mr. Painter spent several years on installation work in various capacities from assistant installer to installer in charge; about two years in efficiency engineering work and conducting the factory training school for student installers and engineers.

For two years he was engaged in engineering the unification of the manual and automatic exchanges in St. Paul and Minneapolis and about an equal amount of time as superintendent of installation in the Twin Cities, carrying the unification work in those two cities through to a successful completion. This task behind him, he was engaged as equipment engineer for the Tri-State company for about 2½ years until named chief engineer in April, 1923.

In 1928 he was elected president of the Engineers Society of St. Paul and at the conclusion of his term of office in 1929 was elected by the society as its representative on the board of directors of the Federation, who in turn appointed him chairman of the resolutions committee. He held this office until his election to the first vice-presidency of the Federation.

Obituary.

T. H. Ashley, special agent of the Bell Telephone Co. of Canada, passed away at his home in Toronto, Ont., Can., on February 17.

After a very strenuous year of work, Mr. and Mrs. Ashley had gone to Florida about the middle of December, expecting to enjoy a few months in the South, where Mr. Ashley hoped to regain his strength, so that he would feel fit to carry on his duties in the future. After his arrival there, his condition became serious, and he returned to his home in Toronto on February 6.

Mr. Ashley had been connected with the telephone industry for many years and had served the Bell Telephone Co. of Canada with great fidelity and distinction for over 27 years. His warm friendliness of manner and unfailing cheerfulness of disposition made him many friends throughout the province of Ontario, wherever his duties took him.

At the Silver Jubilee Convention of the Illinois Telephone Association last November, Mr. Ashley was one of the speakers and made an excellent impression. All who met him during the meeting were attracted to him by his friendly personality.

One of Mr. Ashley's associates in a letter to Secretary A. J. Parsons of the Illinois Telephone Association said: "Mr. Ashley was a true and sincere friend to all with whom he had business relations, and he will be greatly missed in the telephone field."

The unusually large body of friends and associates who attended Mr. Ashley's funeral in Toronto on February 20 was evidence of the high place he had attained in the regard of all who had been fortunate enough to know him.

George W. Mannix, Jr., aged 57, well known as a lawyer, common pleas judge and telephone executive died at Celina, Ohio, recently of blood poisoning. He served for three years as a judge and later formed a partnership with George F. Crawford and T. A. Billingsley to practice law in Celina. He was interested in the telephone business for nearly 26 years, having been a director and later general counsel of the Greenville Home Telephone Co. He was a director of the Ohio Independent Telephone Association for several terms and was vice-president in 1926-1927.

In the past few years, Mr. Mannix took up telephone mergers, being associated with the Goodrich interests of Indianapolis, Ind. At the time of his death he was president of the Interstate Telephone Corp. of Union City, Ind., and the Ohio Telephone Service Co. of Greenville. Both companies had numerous subsidiaries.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Hearings in New York Telephone Co. Rate Case Last Week.

The hearing on the New York Telephone Co.'s rates was continued before the New York Public Service Commission on March 19. Another session was held on Friday, March 21.

The first witness called by the commission on March 19 was Prof. Henry E. Riggs of Ann Arbor, Mich., an expert in matters of valuation and depreciation. He was examined by Colonel Charles G. Blakeslee, counsel for the commission.

Prof. Riggs' first exhibit showed the relative per cent of growth of the New York Telephone Co. and typical railroad and gas properties. From the exhibit it appeared that the growth of the telephone properties has far exceeded the others. Another of Prof. Riggs' exhibits showed the relative percentage of operating income to fixed capital of the properties used in the first exhibit.

Except in isolated instances, he said, the telephone company has enjoyed a higher percentage of operating income than the other properties.

Replying to a question of Col. Blakeslee, Prof. Riggs stated that the straight line theory of depreciation anticipates the deduction of the credit balance in the depreciation reserve in computing a rate base.

A. M. Welch, vice-president of the company, was recalled by Colonel Blakeslee for further questioning as to exhibits submitted and evidence by him. Mr. Welch explained the methods used by him in computing anticipated revenues for 1930 under the rate schedules proposed by the company.

He also developed the effect of the company's proposed rate schedule on the number of 1929 telephones in use and business conditions, and then projected that increase into 1930 giving effect to the number of stations and to the company's anticipation

of a lesser calling rate in 1930 than in 1929.

There were only two witnesses at the hearing on March 21. Theodore L. Rogers of Little Falls, real estate man, testified the value of the company's property used in its telephone business in the city of Little Falls had decreased since 1928.

Dr. H. E. Riggs, was further cross-examined by Counsel Blakeslee for the commission and Mr. Blackmore, attorney for the New York Telephone Co. on the question of depreciation.

Attorneys Appointed to Prevent Increased Rates at Terre Haute.

The city council of Terre Haute, Ind., meeting the night of March 21, approved the selection of two attorneys to serve as counsel for the city in its efforts to prevent the Citizens Independent Telephone Co. from continuing in effect a new and higher rate schedule granted by the Indiana Public Service Commission. It is expected that steps will be taken immediately to appropriate $7,500 for paying the counsel.

Nevada Bell Acquires Small Company in That State.

The Bell Telephone Co. of Nevada was recently authorized by the Interstate Commerce Commission to take over the properties of the Utah, Nevada & Idaho Telephone Co., operating exchanges at Austin, Round Mountain and Pioche, Nev., serving a total of 66 subscriber stations. It also owns toll lines from Manhattan, Nye county, to Fish Creek, Lander county, at which point connection is made with the Bell company's system; and from Pioche to Caliente, which toll lines have a total pole mileage of 204 miles. There are attached to these toll lines 65 stations, serving various ranches along their routes.

The Utah company is unable to make the investment that would be required to rehabilitate its plant, the commission found. At the request of the commission the Bell company made a study of the territory with a view to providing adequate toll service, and reached the conclusion that the operation by it of the Utah company's plant as a part of its own system would enable it to more effectively render adequate service in the entire territory served by both companies.

The Bell company is able and willing to make any investment that may be required to give this section commercial exchange and toll service.

On September 13, 1929, the Utah company gave the Bell company an option to purchase all its physical properties, free from all liens or encumbrances, for $32,000. This option was exercised by the Bell company on October 30, 1929.

An appraisal made by one of the Bell company's engineers found the reproduction cost new of the properties to be $55,760, and less depreciation $30,053.

The testimony is that no books have been kept by those in control of the Utah company, and that it would be practically impossible to furnish a satisfactory income statement. No change in rates is in immediate contemplation.

Ohio Court of Appeals Rules Track-Moving Unreasonable.

That the action of city officials in ordering the Cincinnati Street Railway Co. to place its tracks on the sides of the street at the upper end of Delta avenue was the "exercise of police powers in an arbitrary, unreasonable and unwarranted manner" was declared by the Ohio Court of Appeals in a decision, concurred in by the full bench, granting a perpetual injunction as sought by the Cincinnati & Suburban Bell Telephone Co.

Under the proposed improvement of the street by the city, the plans provided that the east rail of the car track on the east side of the street was to be laid 10.39 from the curb, which would place the rail directly over the top of the conduits. It was claimed that the placing of the car track over the top of the conduits would in effect crush the conduits, and destroy the use of the manholes, and would require the moving of the conduits at an expense of over $30,000, less salvage, together with the interruption of service.

The first contention of the Cincinnati & Suburban Bell Telephone Co. was that it has a property right in the location of its conduits which may not be interfered with without due compensation under the constitution. The second contention was that the placing of the car track on top of the conduits is arbitrary, unnecessary and an abuse of the exercise of the police power of the city.

Many cases were cited by counsel for both parties in support of their respective claims. In the court's opinion the telephone company does not possess any property right in the location of the conduits. This view is well supported by the cases of The Queen City Telephone Co. v. City of Cincinnati, 73 Ohio St. 64; The Lake Shore and Michigan Southern Railway Co. v. City of Elyria, 69 Ohio St. 414; and Railway Company v. Telegraph Association, 48 Ohio St. 390. See also: Ohio Bell Telephone Co. v. The Watson Co., 112 Ohio St. 385, and cases therein cited; and Elliott on Roads and Streets, 4th Ed., paragraph 1066.

The only objection conceivable to the placing of the east car track a short distance toward the center, the court stated, pulling it off of the conduits, is that it would not be uniform with the location of the west track in its relation to the curb. This situation, however, appeals more to the esthetic than the practical side.

A like situation arose upon the improvement of the lower part of Delta avenue from Linwood road south, when that street was improved by macadamizing. A similar improvement was designed for the lower end of Delta avenue and the plaintiff company made the same objection then to placing the car tracks at the side that it made now. At that time the city changed its plan and put the car tracks in the center of the street. It did so owing to the objection made by the Bell Telephone company, and for the purpose, as testified to, of avoiding delay in the improvement of the street by legal action.

This situation argued against the necessity for placing the car tracks along the sides of the street on the upper end of Delta avenue. It also argued against the proposition of non-uniformity of distance between the car tracks on either side, since the tracks in the street for the full length of Delta avenue would not be uniform, the lower end already having the tracks in the center of the street, and the upper end on the sides. So that the difference of some two or two and a half feet between the curb and the track on the east and west sides could not offend under all the circumstances.

The action of the railway company in placing its east rail immediately over the conduits of the telephone company, thereby causing it unnecessary damage and expense, is an exercise of the police power in an arbitrary, unreasonable, and unwarranted manner, the court said and therefore entered a decree granting a perpetual injunction against the Cincinnati Street Railway Co., enjoining it from proceeding to place its tracks over, above, or upon the conduit system on the east side of Delta avenue, in the making of the improvement.

Bell Company's Standard Toll Rates to Apply on Calls.

The Wisconsin Railroad Commission recently granted the application of the Downsville Telephone Co. and the Wisconsin Telephone Co. for authority to apply the standard toll rates of the Wisconsin company on calls from Menomine to Downsville.

The commission held that as a matter of law the company is entitled to have a toll rate established, providing the rate established is not unreasonable. The rate proposed in the application is the standard toll rate of Wisconsin Telephone Co., which, not only is quite generally applicable throughout the state but is also standard for interstate toll business.

In other cases the commission has held that toll rates must conform to standards, which should be applied on a state-wide basis.

Having reached the conclusion that there was discrimination existing under present conditions in this case and since as a matter of law the company may have established a reasonable toll rate, and further, since the reasonableness of the proposed toll rate has been previously passed upon and approved by the commission, the

commission reached the conclusion that the petition of the company in this matter should be granted.

Summary of Commission Rulings and Schedule of Hearings.

ALABAMA.

March 21: Hearing at Lafayette on two citations against the South States Utilities Co., Inc. The company was first cited to show cause why it should not file with the commission a copy of an audit and accounting of the company's accounts. The second citation required the company to show cause why it should not be required to furnish reasonable and adequate telephone service in 16 North Alabama towns.

Following an inspection of the properties about February 1, the company was given notice to improve its properties and make them sufficient to render reasonable service. It was given until March 6 to remedy the conditions and having failed to comply with the terms of the notice the citation was issued.

The South States Utilities Co. serves Aliceville, Carrollton, Fayette, Gordon, Guin, Hackelburg, Haleyville, Hamilton, Reform, Sulligent, Vernon, Winfield, Phil Campbell, Bear Creek, Dime, Ashridge and Double Springs.

CALIFORNIA.

March 17: Permission granted to the Pacific Telephone & Telegraph Co. to discontinue its Tustin exchange and to consolidate the Tustin exchange area with its Santa Ana exchange, and to serve the territory at the present rates prevailing in the Santa Ana exchange.

March 17: The Upper Dry Creek Telephone Co., operating a rural telephone line in the Upper Dry Creek District of Sonoma county, applied for permission to issue 20 shares of stock at $60 per share for the purpose of financing improvements.

ILLINOIS.

March 6: No action taken on:

Illinois Bell Telephone Co. revised sheet 7 for Highland Park, and revised sheet 7 for Highwood to rate schedule Ill. C. C. 1, effective March 27, 1930.

Illinois Commercial Telephone Co. sheet 5 to Ill. C. C. 1, applicable to its Paxton exchange, effective March 26, 1930.

Shannon Telephone Co. revised supplemental sheet 3 to Ill. C. C. 1, applicable to Shannon, effective March 27, 1930.

Dixon Home Telephone Co. original sheet 2 to Ill. C. C. 2, covering charge for coin box equipment, effective April 1, 1930.

Illinois Central Telephone Co. first revised sheet 1 to Ill. C. C. 2, covering toll rates effective March 21, 1930.

C. T. & N. Telephone Co. rate sheet 6 to Ill. C. C. 2, applicable to its Neoga exchange, effective March 29, 1930.

March 6: Order approved authorizing the Illinois Commercial Telephone Co. to purchase and acquire all the outstanding capital stocks of Buckley Telephone Co.; Stronghurst Telephone Co.; Teutopolis Telephone Co.; Ullin Telephone Co.; Corn Belt Telephone Co.; General Telephone Co. of Ill.; Illinois Northern Telephone Co.; Inter City Telephone Co.; Lincoln Telephone Co.; Standard Telephone Co. of Ill., and Evansville Telephone Co.; and each of 11 companies to sell all its outstanding stock to Illinois Commercial Telephone Co.; granting to Illinois Commercial Telephone Co. a certificate of convenience and necessity authorizing it to own, construct, maintain, and operate telephone exchanges or properties and to transact a public utility telephone business in the territory now served by the selling companies; authorizing Illinois Commercial Telephone Co. to issue and sell 80,000 shares of its common capital stock without par value, of the stated value of $40 per share, and $3,000,000 aggregate principal amount of its first mortgage gold bonds, dated March 1, 1928, maturing March 1, 1938, bearing interest at the rate of 5 per cent per annum, bonds to be issued under and secured by the first mortgage or deed of trust, dated March 1, 1928.

March 6: Order approved cancelling and annulling rate schedule Ill. C. C. 4 of the Illinois Telephone Co. applying to Greenfield, Roodhouse, Whitehall and vicinity; and authorizing company to place in effect a modified schedule of rates covering telephone service in Greenfield, Roodhouse, Whitehall and vicinity, to be designated as Ill. C. C. 5, the schedules to contain the same rates, rules and regulations as those shown in rate schedules Ill. C. C. 4, except the extra charge of 25 cents per month for desk type telephones furnished in connection with the classes of service provided for in schedules 1 and 2 of section 2 of tariffs shall be omitted and the initial rate area shall be modified in such a manner to include all subscribers now receiving exchange service without payment of over radius charges in Greenfield, Roodhouse, and Whitehall exchanges, effective April 1, 1930, providing for the following annual rates: Individual business, $39; two-party business, $36; individual residence, $27; four-party residence, $24; rural business, $36; and rural residence, $24.

March 6: Order approved dismissing joint petition filed July 14, 1927, by the Fairbury Telephone Co. and the Colfax Telephone Co. for a certificate of convenience and necessity to operate and maintain toll lines extending from Fairbury to Colfax.

March 6: Order approved dismissing petition of Eldorado Telephone Co. for a physical connection with Eldorado Telephone Co. and the toll lines of Illinois Southern Telephone Co.

March 14: Illinois Commercial Telephone Co. authorized to acquire the properties of the Ashkum Mutual Telephone Co. for $837.50.

March 25: Hearing at Chicago before Chairman Hadley in the matter of the proposed advance in rates for service of the Illinois Northern Telephone Co. in Macomb, McDonough county, stated in rate schedule Ill. C. C. No. 2.

March 26: Hearing at Chicago before Commissioner Brinkman in the matter of the joint application for authority to the Bureau County Independent Telephone Co. to sell and the Illinois Allied Telephone Co. to buy all the property rights, franchises, assets and properties now owned and held by the Bureau company; also for a certificate of convenience and necessity to the Illinois Allied Telephone Co. to operate the properties in Bureau county.

March 27: Hearing before the commission in the matter of the complaint of the city of Evanston, village of Oak Park and village of Wilmette relative to rates charged for service by Illinois Bell company.

March 27: Hearing before Commissioner Wilson in the matter of complaint of the Grundy county telephone subscribers charged by the Illinois Bell Telephone Co. in Grundy county.

March 27: Hearing before Commissioner Wilson in the matter of the complaint by Joseph H. Francis, J. Hubert Crain and John Peacock, Jr., of unreasonable rural and urban rates for service by Illinois Bell Telephone Co. in Grundy county.

March 27: Hearing before Chairman Hadley in the matter of petition of the city of Aurora for reduction in telephone rates charged by the Illinois Bell Telephone Co. in Aurora.

INDIANA.

March 22: Attica Telephone Co. authorized to increase its rates. Under the new schedule the company will increase its revenue about $5,000 a year. Single business lines were increased to $3.50 and single residence to $2.50 a month.

March 22: Leisure Telephone Co. authorized to increase its rates 25 cents a month.

March 22: New Brunswick Citizens Telephone Co. authorized to increase rates 25 cents a month.

MISSOURI.

March 14: Joint application filed by J. M. Roberts to sell and the Inter-County Telephone Co. to purchase the telephone property of the Altamont Independent Telephone Co.

NEBRASKA.

March 17: Application filed by the North Star, Sheridan & Curtis Telephone Co. for authority to publish and collect a rate of $1.50 a month gross for service.

March 19: Application filed by the Nuckolls County Independent Telephone Co. for authority to substitute metallic service for grounded magneto service at its exchanges at Nora, Oak and Ruskin, a proposed schedule of higher rates to go into effect when the work is complete, accompanied by consent petitions from patrons.

March 20: Application filed by Lincoln Telephone & Telegraph Co. for authority to establish rural metallic service and rate at its Carleton exchange.

March 20: In the matter of the application of the Nuckolls County Independent Telephone Co. for validation of 50-cent differential rate for business service on rural life; found reasonable and authority granted as asked.

NEW YORK.

March 24: Hearing at Utica in the matter of certain tariff schedules of the Black River Telephone Co. proposed to be effective July 1, 1929; tariffs suspended. Complaints filed by board of trustees of Lowville, Adams and Lyons Falls and of the board of supervisors of Lewis county.

OHIO.

March 14: Application filed by Ohio Bell Telephone Co., operators of the Tiffin Consolidated Telephone Co., asking that it be allowed to omit flat rate toll switching service because of no subscribers; to omit toll rates to Tiffin and Bascom, which are higher than standard tolls; to omit regulations governing payment of bills and to omit regulations governing long distance service, moves and changes.

OKLAHOMA.

March 25: Hearing on application of Ketchum Hotel vs. Southwestern Bell Telephone Co. to install its own P. B. X. system and fix rates for trunk lines.

March 26: Hearing on application of Beggs Telephone Co. for authority to increase rates at Beggs.

March 26: Hearing on application of Standard Telephone Co. to increase telephone rates at Carter, and also at Strong City.

March 27: Hearing on application of Standard Telephone & Telegraph Co. for permission to discontinue free service between Cordell and Bessie.

SOUTH DAKOTA.

March 19: Dakota Central Telephone Co. authorized to place in effect a schedule of increased rates at its Roscoe exchange.

Ardwick Exchange, Manchester, England

Manchester the First of Provincial Telephone Areas to Which the Director System Will be Applied—Three Automatic Exchanges of Which Ardwick is One, Will Soon be Opened—Summary of Main Items of the Exchange Equipment Used

By P. S. Davis,
Siemens Brothers & Co., Ltd., Woolwich, England

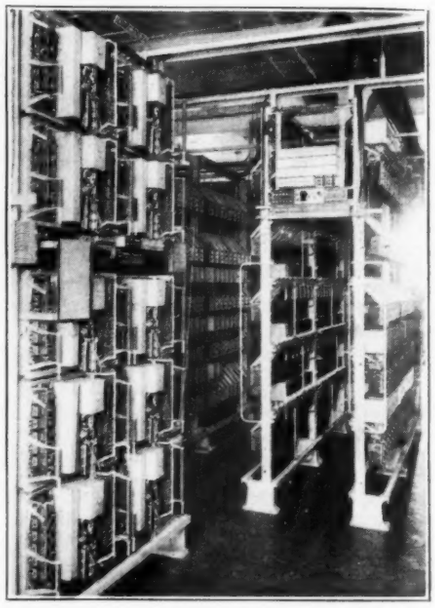
The telephone systems in a number of provincial cities of Britain, notably Edinburgh, Sheffield, Southampton and Brighton, have been successfully converted to automatic working, but hitherto the character of the traffic requirements has not justified the application of the director system of automatic telephony. Manchester, the center of the British cotton industry, is the first of the provincial telephone areas to which the director system will be applied, and three automatic exchanges, of which Ardwick is one, will shortly be opened.

The conversion of such a network as this, having a number of manual exchanges which have not yet reached the term of their economic life, must of necessity be gradual, and must provide for the changing conditions which arise at each stage of the development. This is an intricate problem, and due acknowledgment of the manner in which the engineers of the British Post Office have foreseen and overcome the difficulties must be made.

Ardwick exchange, the equipment of which has been manufactured and installed by Siemens Brothers & Co., Ltd., is situated within a short distance of the center of the area, and provides initially for 3,150 subscribers' lines. The exchange equipment at present is accommodated on two floors, but a third floor will be added to the building when the need for extension of the equipment arises. A summary of the main items of the equipment is as follows:

252 First code selectors.
55 Second code selectors.
283 First numerical selectors (18 for local traffic and 265 for incoming calls from other exchanges).
227 Second numerical selectors.
216 Final selectors for ordinary subscribers (18 groups).
285 Final selectors for P.B.X. subscribers of 2-10 lines (15 groups).
12 Final selectors for P.B.X. subscribers of 11-20 lines (one group).
32 "A" digit selectors.
49 Directors.

On account of the limitation in the number of groups of outlets which it is possible to obtain from the first code selectors, and in order to economize in switching equipment, it is the practice in director exchanges to confine the use of the levels of these switches wholly to large blocks of traffic, the outlets for the smaller groups being obtained from the subsequent rank of switches, namely the second code selectors.



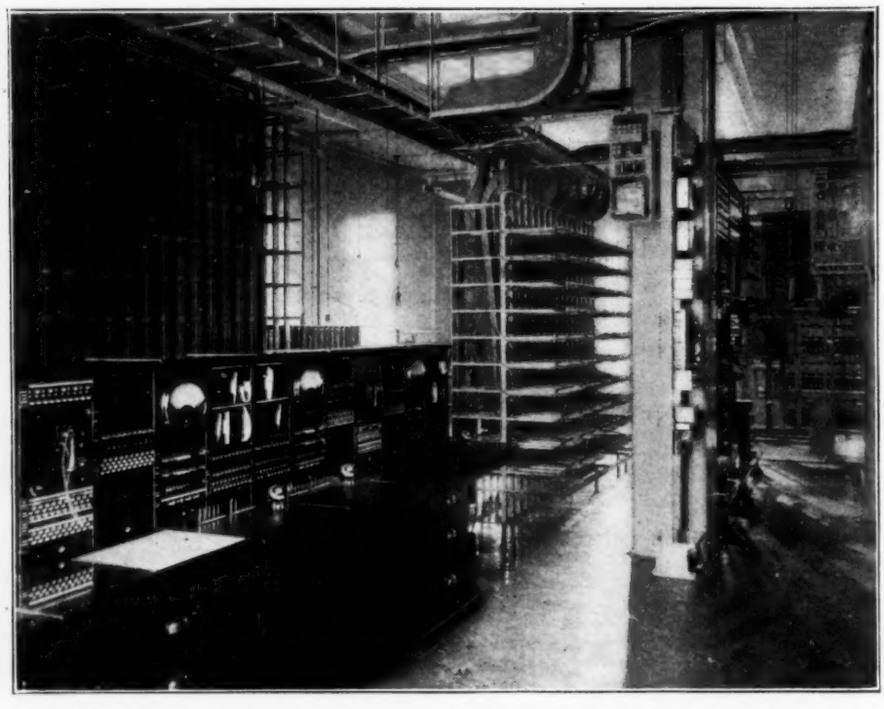
View of Portion of First Numerical Selector and Director Equipment in the Ardwick Exchange, Manchester, England.

In most exchanges, local calls form a sufficiently high proportion of the total traffic to justify the use of a first code selector level solely for this purpose, and the calls are routed direct from this level to the subsequent numerical switches.

In this exchange, however, such traffic is relatively small compared with the total; and it is, therefore, routed through a group of second code selectors which also gives access to other exchanges, thus insuring that the fullest possible use is made of the first code selector levels for the large groups of outlets to the second code selectors and to exchanges in the area to which the calling rate is high.

Another interesting feature in this exchange is the adoption of switches with 20 contacts per level for the second numerical selectors, as well as for the first code and other group selectors. Having a greater traffic efficiency for large groups of outlets, their use is general on the earlier ranks of selectors; but their application to the pre-final rank in this instance is an indication of the high rate of provision of switching equipment for the subscribers' groups.

As in other director areas, the subscribers dial the first three letters of the exchange name, the impulse train corre-



General View of Apparatus Room in the Ardwick Telephone Exchange, Manchester, England, Showing the Four-Position Test Desk, Main Distributing Frame and Intermediate Distributing Frame.

sponding to the first letter controlling the "A" digit selector and giving access to the group of directors in which the exchange concerned is dealt with. The contacts in the banks of the "BC" switches in a group are allotted to exchanges in accordance with the impulses corresponding to the second and third letter dialed.

It is possible, therefore, in an area where the exchange names are such that the impulse trains corresponding to the second and third letters of the exchanges in any two or more groups of directors do not coincide, to combine these groups; and by reason of a greater traffic efficiency, so to effect a considerable economy in switching equipment. This practice has been adopted at Ardwick, in common with other exchanges in the area; and having regard to the present and projected exchange names, it has been possible to reduce the number of groups of directors from eight to three by commoning the outlets of certain levels of "A" digit selectors.

Until subsequent stakes in the conversion of the area are reached, the calls from subscribers on existing manual exchanges to the Ardwick subscribers will be dealt with either by order wire through keysender "B" positions or dialing-in from a central exchange, or by direct dialing-in junctions from the exchange concerned when these are justified. The switching equipment at Ardwick for dealing with calls from automatic or manual exchanges does not differ, except that repeaters are required for dialing-in junctions from manual exchanges.

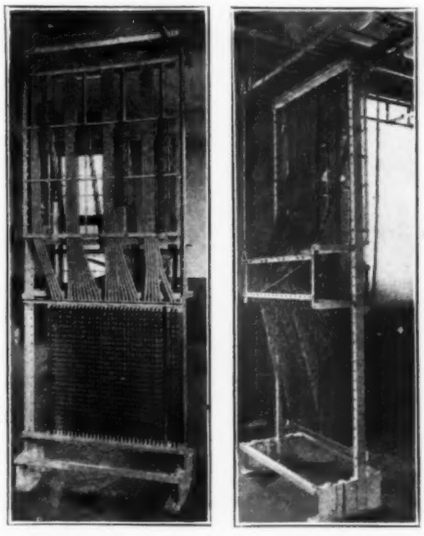
Inquiries and special service calls are dealt with at a central exchange in the area.

The preselector distributing frame shown in one of the accompanying illustrations is used for grading and distributing the outlets from the subscribers' rotary line switches. It is compact in form, and the terminals and wiring are readily accessible for the purpose of rearrangements. The cables from the line-switch units are terminated on 25-part terminal strips mounted vertically at the bottom of the frame and the grading commons in front are horizontal.

The jumper wires are led through fanning strips, which also serve as supports for the incoming cables, and thence via distributing rings to the I. D. F. type terminal strips at the top of the frame. From these, the cables are run to the subsequent rank of switches, in this instance, the first code selectors. Each unit is capable of accommodating the outlets from 40 groups of line switches, and the overall dimensions are the same as those for the line switch and final unit.

The power plant comprises two batteries, each capable of taking the exchange load for 24 hours and having a capacity of 2,154 ampere-hours at a nine-hour rate. When the need arises, plates can be added to increase the capacity of 3,133 ampere-hours. Duplicate charging machines and ringing machines are also provided.

In order to keep within the prescribed limits of voltage drop, the main distribution leads are of two square-inch cross-sectional area (two cables in parallel) and feed the power distribution units fitted at



Front and Rear Views of Preselector Distributing Frame, Ardwick Exchange, Manchester, England.

intervals throughout the exchange. The distribution leads from these to the selector racks, etc., are of 0.1 or 0.12 sq. in. cross-sectional area, according to the current taken and the length of run.

The tests performed by the Post Office on the equipment proved highly satisfactory and insure that the exchange will work efficiently when brought into service.

The writer is indebted to the engineer-in-chief of the British Post Office for permission to publish this article and the accompanying illustrations.

Good Attendance for Iowa Convention; Fine Program Prepared.

The 35th annual convention of the Iowa Independent Telephone Association will be held at the Hotel Fort Des Moines, Des Moines, April 8, 9 and 10. A large convention committee has been actively at work in arousing interest in this meeting, and the officers of the association are thus assured of a good attendance.

The program will include addresses by: F. B. MacKinnon, president, United States Independent Telephone Association; L. H. Cook, chairman, Iowa State Board of Assessment and Review; Fred R. White, chief engineer, Iowa State Highway Commission; L. C. Oberlies, personnel director, Lincoln Telephone & Telegraph Co., Lincoln, Neb.

An interesting power arc follow-up demonstration will be staged by engineers of the Northwestern Bell Telephone Co.

A discussion of rural service problems will be presented by H. A. White, manager of Kansas City branch of the American Electric Co. A discussion of pole line locations on the highways, moving poles, etc., will be lead by P. C. Holdoegel, of Rockwell City; and a round table discussion of plant and kindred problems will be conducted by J. M. Plaister, of Fort Dodge.

A commercial section meeting will be a new feature of the convention. This will be conducted by J. E. Lynch, of Sac City. It will give opportunity for the discussion of a wide variety of commercial problems including public relations and collections.

The annual banquet, entertainment de luxe, and dancing party, the big social event of the convention, will be held Wednesday evening, April 9.

Meetings for operators, supervisors and chief operators will be held April 9 and 10. and a program of real interest will be given.

A hearty invitation is extended to all telephone companies, whether members of the association or not, to be represented at this convention.

All of the leading manufacturers and suppliers of equipment, apparatus and supplies have reserved exhibit space and will display their wares.

A large number of out-of-the-state telephone men have signified their intention of attending the sessions.

Telephone Company Takes Charge of Rotary Club Entertainment.

The Southern Indiana Telephone & Telegraph Co. recently had charge of the entertainment of the Rotary Club at Madison, Ind.

The company showed three reels of r. . ion pictures, one illustrating the various steps a telephone call takes in being passed from San Francisco to Plymouth, England, or from any other points. The second reel showed in detail the process in transmitting photographs by telephone and the third was a comedy entitled "Now You're Talking."

The company followed this with an entertainment in the city hall at Madison for its employes in that territory. This was held in the evening and while particularly for the employes, the general public was invited and attended in large numbers.

Pennsylvania Bell Establishes Paid Time-of-Day Service.

Since March 1 Pennsylvania telephone users of Bell company exchanges have been able to obtain the correct time at any hour of the day or night by asking the operator for "the time." The service is established to meet the general demand for this form of information.

Since its institution throughout Pennsylvania will create an additional operating expense for the Bell company, a charge of five cents is made for each call for time of day information.

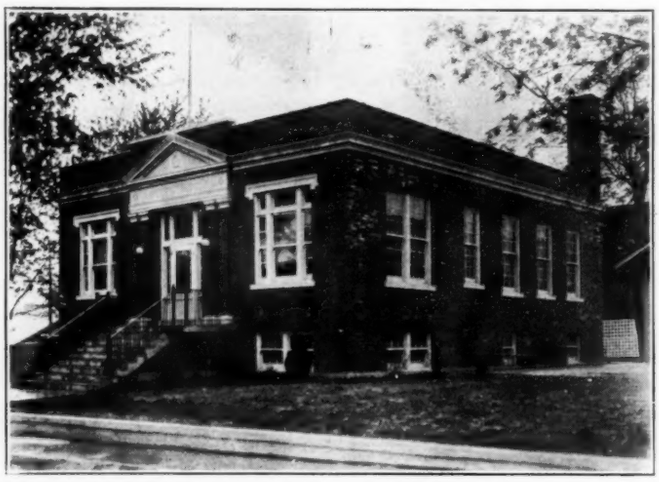
Service Development in Missouri Town

Albany Telephone Co., Albany, Mo., Was Organized on a Mutual Basis With About 60 Patrons in February, 1897—In 1918 the Company Was Placed on a Dividend-Paying Basis—New Building Constructed in 1927—New Equipment

By P. Winemiller,
Sales Engineer, Stromberg-Carlson Telephone Mfg. Co.

The organization of the Albany Telephone Co. of Albany, Mo., dates back to February 26, 1897. The company was organized on a strictly mutual basis with about 60 patrons. It was continued on that basis until the year 1918 when it was decided by the stockholders to place the company on a dividend-paying basis, if possible.

The first difficulty to overcome was the discontinuance of the free service to nearby exchanges which, of course, produced considerable opposition but was finally brought about. At the same time, it was also decided to purchase a new and modern type switchboard.



Albany Telephone Co.'s Exchange Building at Albany, Mo.

It was realized that it would be difficult to obtain an increase in the local rates after discontinuing the free service. However, the company had a great desire to give central energy service to the local patrons, the management realizing that it was almost impossible to serve the number of subscribers they had in a satisfactory way with magneto service.

At this time the so-called universal or convertible board was in favor. After looking over many types of equipment, it was decided to buy a board of this kind with the thought in mind that the subscribers, knowing that they could obtain central energy service at a slight increase in the rate, would voluntarily ask for the improved service.

The switchboard purchased was properly installed and maintained to the highest degree. But, as usual, it failed to raise the rates. The patrons did not flock into the telephone offices asking for the improved service but, like any other community, they kept their magneto instruments.

The company's officials solicited the patrons to take the new service but met with only mediocre success. In fact, out of some 600 subscribers, 75 of which were business houses, there were less than 150 central energy subscribers at the end of a period of ten years.

The service given over the board was on par with what could be expected from a board of this kind. The supervision was anything but positive. In fact, it was necessary for operators to monitor all connections, thus not only slowing up the service but also interrupting many conversations.

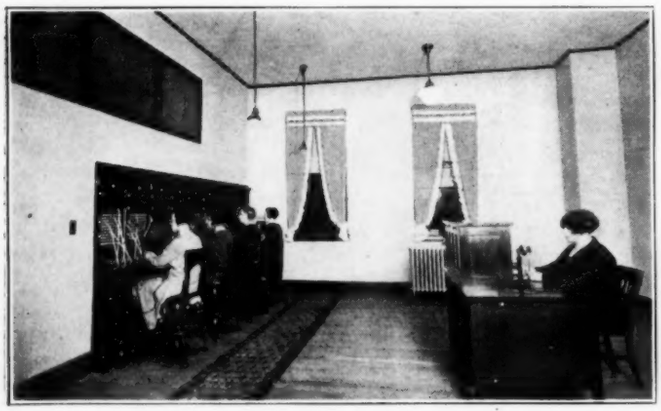
Having failed to bring about the conversion of the local stations to central energy, and having also a desire to own their own building in which to house the exchange equipment and offices, the management decided during the year of 1927, to construct a new building, completely rebuild the outside plant and install new central office equipment of the most modern type.

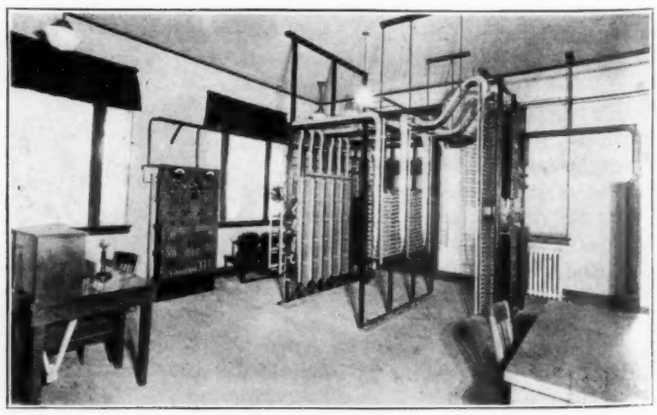
Officials of the company made numerous trips looking over different types of buildings and central office equipment, conferring with officials of other companies and their patrons as to the service being given, studying the several types of cable plants, etc.

After considerable study, it was decided to purchase a switchboard and associated apparatus as well as telephones, from the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., and, accordingly, they entered into a contract with the Stromberg-Carlson company for complete new equipment.

While this equipment was in course of manufacture the outside plant, which was 90 per cent metallic but in aerial cables and open wire, was completely rebuilt, all cables being placed underground with the result that there is but one pole per block in 70 per cent of the blocks in town.

The switchboard consists of four positions of Stromberg-Carlson superservice boards having one toll, one rural and two local positions. The toll position is equipped with eight high efficiency toll universal cords arranged for 48-volt trans-





Stromberg-Carlson Switchboard in Operation in the Office of the Albany Telephone Co. at Albany, Mo. — View Showing Rear of Switchboard, on Extreme Right, Relay Racks, Terminal Racks, Ringing Machine, Power Board and Wire Chief's Desk at Albany, Mo.

mission. The rural position is equipped with 17 full feature universal cords and each local position is equipped with 17 super-service cords.

The local and rural positions are equipped with the well-known master-key ringing equipment developed and perfected by the Stromberg-Carlson company. As the Albany board is arranged for two-party ringing, this master-key arrangement cuts the number of ringing keys in each position from 34 to two. With such an arrangement it is obvious that an operator can handle a considerably greater load without fatigue than with the old method now practically obsolete, so far as up-to-date installations are concerned.

All rural and toll lines in the board are lamp-ended and arranged to faithfully indicate code rings. Each rural line is equipped with a restoring key, allowing the operator to extinguish the line lamp when a line ring is being placed on the line without inserting a plug, thereby saving time as well as wear on the plugs and jacks.

The local lines employ the use of the well-known Stromberg-Carlson 190-type line and cut-off relays of which there are over 100,000 lines now in use. Due to the unique construction of these relays the amount of space required to mount them is about half that required by the old-style line and cut-off relays, and it is a well known fact that the maintenance is practically nil.

All line and cord-circuit relays are mounted on frames in the terminal room. This arrangement not only allows the rear of the sections to be almost devoid of equipment but also places all cord and line circuit relays in an accessible position.

All cord circuits are assembled on individual circuit plates one circuit per plate. A complete cord circuit may be removed for inspection or test by the loosening of a few screws, making use of a soldering iron not necessary.

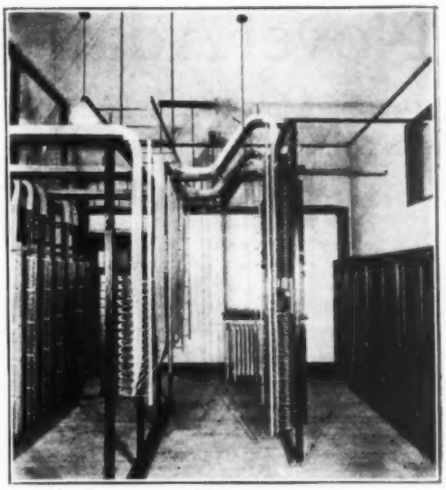
The main booster and noise-killing batteries are located in a special battery room in the basement and all wires between the batteries and the large powerboard are enclosed in conduits. Charging current is obtained from a 30-ampere diverter pole motor-generator of the latest and most approved type.

Albany certainly has one of the most complete and up-to-date telephone plants in the country today. Service satisfactory to both patrons and stockholders is being given at a rate that does not work a hardship on the patrons and, at the same time, allows a fair earning on the investment.

A recent issue of the Albany Ledger asked these questions:

"Do you know that Albany is in the second richest county in the state; that few towns of its size have as good schools; that it had no failure during the epidemic of bank crashes; that its light and water plant is a paying proposition? If not, please advise Editor Ben L. Peery, who will take great pride in submitting the proofs."

All patrons of the Albany Telephone Co. will advise Mr. Peery that Albany also has the best telephone service, and no doubt Mr. Peery will gladly include it in his questionnaire.



View Showing Location of Stromberg-Carlson Super-Service Switchboard, Placed in the Partition by the Albany Telephone Co. So That the Rear of the Board Is Accessible Without Entering the Operating Room.

More Utility Regulation Bills in New York Legislature.

Eight more bills, all important in the new plan for stricter utility regulation and one of them highly controversial, were introduced in the New York state legislature on March 17 for the Knight commission on revision of the public service law.

One bill provides for a complete evaluation of all utility properties in the state, with the exception of steam and street railways, as a basis for rate fixing and contract making. This would cost several million dollars and require over three years. Another of the bills creates this valuation and research bureau.

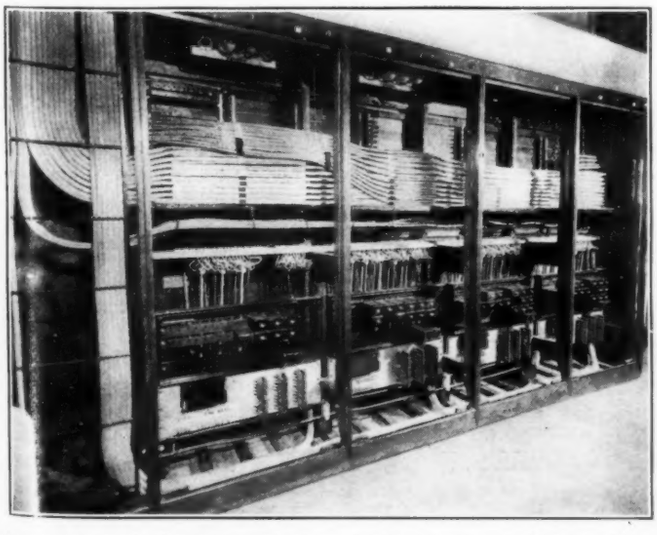
The measure, however, that will provoke immediate disputation is that which would set up the office of "people's counsel" as a deputy in the attorney general's department to investigate complaints, initiate low rate actions and generally represent the public in cases before the public service commission.

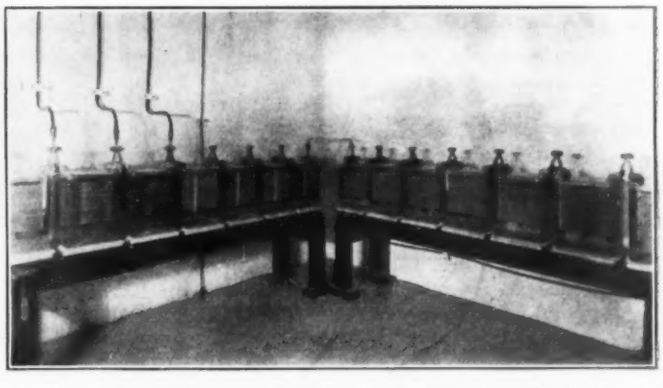
The introducers of the bill explained that they proposed a position independent of the public service commission because of "the necessarily somewhat judicial character of the commission and the difficulty of combining judicial functions with prosecuting functions."

Discussing the evaluation bill, the legislators call it the chief recommendation for an equitable determination of dates, preferably fixed in ten-year contracts.

Another measure extends control over holding companies. The actual identity of persons and corporations owning directly or indirectly substantial interests in the voting stocks of companies under the commission's jurisdiction would be disclosed through annual reports and sworn statements.

Four of the bills aim to tighten the public service commission's control over the accounting methods of utility companies. They place the burden of proof upon the companies to justify every entry in their books questioned by the commission.





Rear View of Stromberg-Carlson Switchboard at Albany, Mo., Showing Cable Piles and Turning Section.—Battery Equipment of the Albany Telephone Co. at Albany, Mo.

Novel Adaptation of Strowger Automatic

Most Recent Use of Automatic Telephone Exchange Equipment in the Recording and Computation of Bets Made by Public at Race Meetings—Description of Installation of Totalisator at the Thirsk Race Course, Yorkshire, England

By J. W. Catchpole,
Automatic Telephone Mfg. Co., Ltd., Liverpool, England

When Almon B. Strowger many years ago conceived the idea of his now world-famous invention, which today forms the basis of upwards of 6,000,000 automatic telephones in use throughout the world, neither he nor the sponsors of his patent foresaw its application in any other sphere than that of automatic telephony.

So flexible and adaptable a principle as that of step-by-step automatic switching, under the control of electrical impulses, was nevertheless destined to have other uses, and as events have since proved, these are many and varied. One of the most recent and interesting applications of Strowger automatic telephone equipment is to electro-mechanical betting on race courses, in what is known as the totalisator.

Betting by totalisator involves the return of the whole of the stake money, less a small percentage by way of tax or commission to cover expenses, to the successful backers. In its earliest form the system was worked by hand, and the results made known to the public by means of a manually-operated indicator. Later, mechanical means were devised, both for registering the bets, totaling them and displaying the results on an associated indicator, the mechanism being driven by electric motors.

The adoption of totalisator betting on British race courses in July, 1929, soon made apparent the inadequacy of the older, manual method of calculation, involving, as it did, large staffs and the possibility of error; while existing mechanical totalisators were considered too unwieldy and inflexible.

To meet the urgent demand for a reliable and efficient all-electric totalisator, engineers of the Automatic Telephone Mfg. Co. Ltd., Strowger Works, Liverpool, reviewed the possibility of adapting proved Strowger automatic telephone exchange mechanisms and circuits to a solution of the problem.

As an outcome, that company designed and manufactured a highly successful electrical totalisator, free from the inertia of the mechanical type, and meeting all the requirements of the British Race Course Betting Control Board, which has adopted it as its standard.

At the board's request a demonstration equipment of the A. T. M. totalisator was recently installed at the Thirsk race course, Yorkshire, England, where its performance was witnessed by members of the board, and on a subsequent occasion by a gathering of British press representatives, prominent race-course officials, and others interested in horse racing.

Both demonstrations proved highly successful, the Strowger automatic equipment fulfilling its duties in accordance with the series of imaginary bets or stakes, which were chosen with a view to making the test one of maximum stringency.

The trial equipment at Thirsk was for six runners only, but the A. T. M. totalisator is capable of catering for a maximum field of 80 horses, which amply covers any requirements likely to obtain at the largest and most popular race meetings in England or elsewhere.

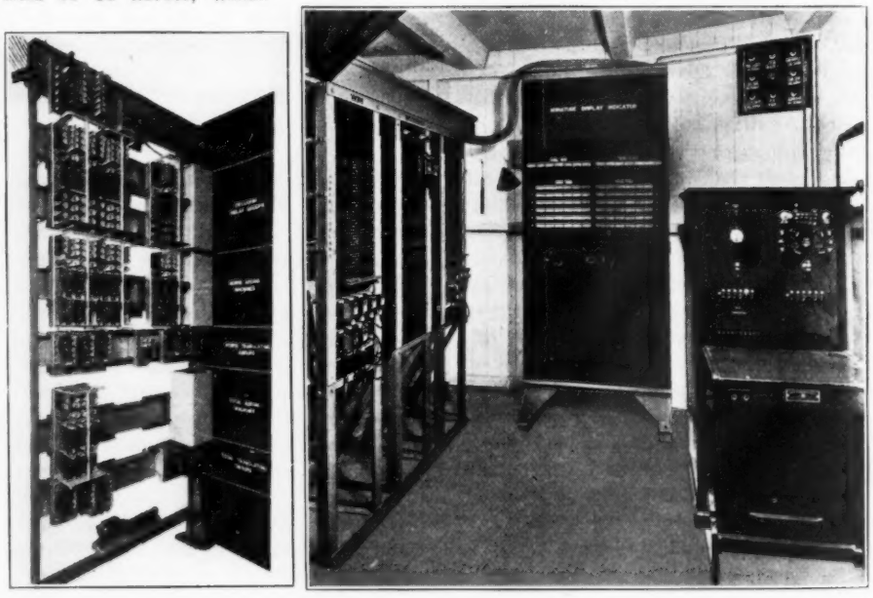


Fig. 1. R. B. C. B. Standard, All-Electric Totalisator, Showing Arrangement of Strowger Electro-Mechanism and Method of Mounting. Covers Removed from All Except Three of Detachable Units—Fig. 3. Central Control Board and Miniature Indicator of Totalisator.

The A. T. M. totalisator incorporates two well-known components of Strowger automatic telephone equipment, the horizontal automatic relay and the heavy-duty rotary line switch, both well proved in everyday public telephone service.

A complete A. T. M. totalisator installation comprises ticket-issuing machines; various Strowger switch and relay groups, mounted as detachable units on single-sided racks, an indicator, and a central control board.

The ticket-issuing machines installed at Thirsk were made by the Bell Punch & Printing Co. Ltd., Uxbridge, but the Automatic Telephone Mfg. Co. has also developed a ticket-issuing machine which incorporates several interesting features.

Depression of the various keys in response to the requests of backers closes electrical contacts and sets up series of impulses which actuate the Strowger mechanism.

Only ten wires, apart from battery leads, are required between an 80-horse ticket issuing machine and the Strowger switch and relay groups of the main equipment.

This represents a marked economy over other systems in cabling between the machines and the central equipment, as well as reducing the possibility of breakdown due to cable faults.

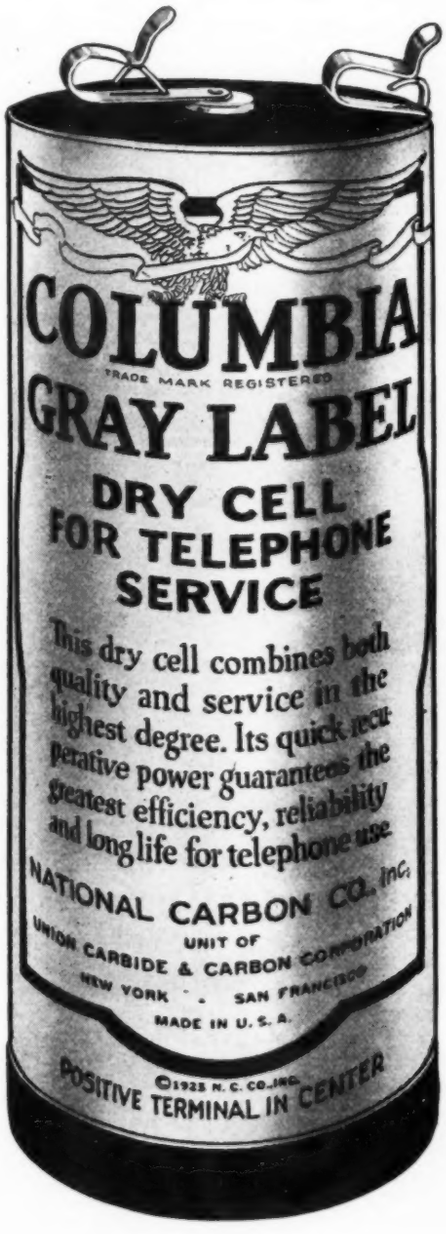
The number of ticket-issuing machines in use and their location are determined by the nature and magnitude of the race meeting. Suffice it that any desired number can be accommodated, and that there are different machines for the five denominations or values of individual stakes.

From the ticket-issuing machines the circuits (ten wires per machine) pass to the main equipment, which comprises the following Strowger switch and relay groups:

The "Place" change-over relay group, consists of a number of relays, the function of which is to discriminate between "win" and "place" bets before these reach their respective adding machines for registration.

The decoding relay group receives the

"They're made to last longer!"


COLUMBIA
TRADE MARK REGISTERED
GRAY LABEL
DRY CELL FOR TELEPHONE SERVICE
This dry cell combines both quality and service in the highest degree. Its quick recuperative power guarantees the greatest efficiency, reliability and long life for telephone use.
NATIONAL CARBON CO. INC.
UNIT OF
UNION CARBIDE & CARBON CORPORATION
NEW YORK SAN FRANCISCO
MADE IN U. S. A.
©1925 N. C. CO. INC.
POSITIVE TERMINAL IN CENTER

COLUMBIA Telephone Batteries last longer because they are completely protected against hydrogen suffocation. *All* telephone dry batteries produce hydrogen gas in discharging.

Hydrogen cuddles up around the negative pole in bubbles—restricts current output in most batteries. Scientists call it "Polarization."

Columbia Telephone Batteries resist polarization. Their fast regenerative powers overcome it. Their quick recuperation when the receiver is down is due to an internal and effective chemical that absorbs hydrogen.

That's why Columbia Telephone Batteries are more economical! Why more are used. Put them in *your* circuit for efficient, long-lasting service.

NATIONAL CARBON COMPANY, INC.

***General Offices:* New York, N. Y.**

***Branches:* Chicago Kansas City New York San Francisco**

Unit of Union Carbide UCC ***and Carbon Corporation***

Columbia Telephone Batteries

—they last longer

signals over the ten wires from the ticket-issuing machine, transforms them into their corresponding betting equivalents, and if all is in order, passes them on for registration by the adding machines. This group responds to operation of the horse number and "win" or "place" keys on the ticket-issuing machine, making the corresponding selection. On depression of the stake key, the group releases the bet for registration on the adding machines.

Interposed between the decoding relay group and each adding machine are the collecting switches. These comprise Strowger heavy-duty rotary line switches, and their function is to successively collect the bet signals from the various ticket issuing machines.

While betting is in progress, these switches are in continuous rotation at a speed of about 50 r. p. m., the brushes traversing 2,400 contacts per minute. This high speed provides an ample margin for coping with the busiest pre-race period, when hundreds of ticket-issuing machines may be in use simultaneously.

In these circumstances the total adding machines would also be in continuous operation, the totals changing as rapidly as 40 to 50 times per second. Due to simplicity of the circuits and the absence of any need for electrical synchronization of switches, the utmost accuracy is assured.

Strowger heavy-duty rotary line switches in association with relays comprise the adding machines, of which there is one for each horse "win" and each horse "place," together with two total adding machines, "win" and "place" respectively. The adding machines are interchangeable, and their name implies their function, viz., that of aggregating the bets received from the collecting switches and transmitting the resultant totals to the indicator for visual display.

The maximum capacity of each adding machine is 2,400 bets per minute, of each denomination, or a total of 12,000 bets per minute. In the unlikely event of this capacity being exceeded, the machine automatically controls ticket issuing, which is held up until the adding machine has overtaken its arrears and is again in a condition to register bets.

The whole of the Strowger switch and relay groups described, constitute the main equipment of the A. T. M. totalisator and are mounted on single-sided racks, at a convenient central point, as shown in Fig. 1. The individual groups are all arranged to "jack-in" on horizontal pressed steel shelves of channel section, the arrangement being such that any group can be immediately detached or replaced without disturbing the permanent wiring or interfering with the general progress of betting.

This method of mounting and wiring Strowger equipment coincides with that recently developed for the British Post Office by the Automatic Telephone Mfg. Co. Ltd. Among its advantages are maximum protection of wiring, cabling and apparatus against accidental damage as well as against accumulation of dust. Each group has an individual dust-proof metal cover, while slip-on covers also protect the wiring, tags etc.

The "jack-in" principle applies similarly to the ticket-issuing machines, as well as to the component sections of the indicator.

The indicator of the A. T. M. totalisator is on the lamp monogram principle, each unit or numeral comprising a bank of 24 Mazda lamps, the lighting of selected groups of which forms luminous figures in accordance with the signals transmitted by the adding machines.

The front of the demonstration indicator at Thirsk, illustrating the effect when totals are displayed, is shown in Fig. 2. It will be seen that there are six banks of lamps or monograms in line with the number of each horse, and seven for the respective totals, "win" and "place."

Every lamp is light-insulated from its neighbor, housed in a blackened background and surmounted by a blackened grille, the result of this arrangement being that the illuminated figures are clearly visible in direct sunlight from a distance of over 150 yards, to the public on the course, and from any angle up to 30 degrees.

Fig. 2 R. B. C. Standard, All-Electric Totalisator, Front of Demonstration Indicator.

Associated with each figure is the mechanism for controlling the grouping of the lamps for lighting in accordance with the received signals, both the mechanism group and the bank of lamps being on the "jack-in" principle and interchangeable.

Individual monograms and their associated control units can be removed during the progress of betting without affecting the totals, which will indicate correctly and in accordance with the amended figures immediately the indicator units are replaced in circuit.

If necessary, the A. T. M. indicator can be arranged as at Thirsk, to display simultaneously on both sides, and any number of subsidiary indicators can be worked in parallel with the main indicator without additional equipment, or regard to their location.

The central control board, Fig. 3, is the key to the entire A. T. M. totalisator installation and enables the fullest possible control over the betting, including all ticket-issuing machines and the horses running in each race, to be exercised by one individual if necessary. It is equipped with a number of keys, and corresponding signal lamps, one key representing each horse and each total adding machine, "win" and "place" respectively.

Betting is started by manipulation of the corresponding keys at the control board. Thus, if both "win" and "place" betting are permitted, the total "win" and total "place" keys are operated, followed by the various horse "win" and "place" keys representing the actual runners. If there is no "place" betting, these keys are left normal and it is impossible for the ticket issuing machines to accept "place" bets.

Restoration of the horse and total keys to normal immediately stops all betting inasmuch as the issue of tickets is controlled from the adding machines, and a horse adding machine cannot continue in service unless the corresponding total adding machine is also working.

The signal lamp associated with each key glows as long as the key is in the operated position and enables the controller to see at a glance what portion of the equipment is working and registering bets. Furthermore a miniature replica of the main indicator, seen to the left of the control board, reproduces the horse and total figures simultaneously with their display on the main indicator, thereby keeping the

ASSOCIATED TELEPHONE AND TELEGRAPH COMPANY

Kansas City Chicago New York

Paid-Up Capital Over $15,000,000

THE ASSOCIATED TELEPHONE AND TELEGRAPH COMPANY, which is owned by British and American Interests, undertakes outside of United States of America:

1. Engineering, Construction, Management and Operation of Complete Telephone Installations.
2. The Examination, Negotiation and Acquisition of Telephone Concessions.
3. Financing Telephone Operating Properties, or Extensions to Existing Plant.

THE ASSOCIATED TELEPHONE AND TELEGRAPH COMPANY and its Allied Companies own and manage directly or indirectly upwards of 300,000 Telephones, and are connected with important British and other Manufacturing and Financial Interests throughout the World.

Corporate Headquarters: 100 West Monroe Street, Chicago
Cable Address: "TELANTEL"

Bankers in U. S. A.

Harris Trust and Savings Bank, Chicago, U. S. A.
Continental Illinois Bank and Trust Company, Chicago, U. S. A.
Commerce Trust Company, Kansas City, U. S. A.
Guaranty Trust Company of New York
Bank of America, New York, U. S. A.
U. S. Financial Agents: Theodore Gary and Company, Kansas City

Bankers in London

Westminster Bank Limited
London Financial Agents: Theodore Gary and Company London
Stafford House, Norfolk Street, Strand, London, W. C. 2.

TELERING

For Central Office and PBX Ringing

ONE REED!

ONE CONTACT!

IDEAL WAVE FORM

ORDER ONE ON TRIAL.

NO OBLIGATION TO KEEP

Fully Guaranteed

Converts 60 Cycle Lighting Current to 20 Cycle Ringing Current.

POSITIVELY NO RADIO INTERFERENCE

Very low current consumption.

Model EX-3 has been proven the ideal ringing machine by hundreds of satisfied users.

Price $44.00 — F. O. B. Elyria
IT PAYS FOR ITSELF

Sold by Leading Telephone Distributors

Telkor, Inc., Elyria, Ohio

(Write for booklet)

KLEIN TOOLS

Since 1857

Mathias Established 1857 **KLEIN** & Sons Chicago Ill USA

Note protection at corners

Blake Insulated Staples

Trade Mark

Unequalled for telephone and bell wiring. The fibre insulation prevents troublesome short circuits and grounds.

4 Sizes. Pat. Nov. 1900

Write for samples

Blake Signal & Mfg. Co.
BOSTON, MASS.

RAINIER FIR · CROSS ARM

TRADE-MARK

AMERICAN CROSS ARM & CONDUIT CO.

THE OLDEST AND LARGEST PRODUCERS IN THE WORLD

Mills on Pacific Coast—Atlantic Coast—Texas
Factories at Chicago, Kansas City, Newark

CREOSOTED YELLOW PINE CROSS ARMS and CONDUIT

Locust Pins — Oak Brackets

OFFICES—1458 McCormick Bldg.—CHICAGO
220 Broadway—NEW YORK

The advertiser appreciates your mentioning TELEPHONY.

controller informed of the state of the betting at any moment.

By means of a master key the end of the betting period, which coincides with the start of the race, may be controlled by the starter or other official from the startting post, remote from the control board. Manipulation of this key stops the issue of tickets at all machines on the course, and simultaneously the signal lamps at the control board are extinguished.

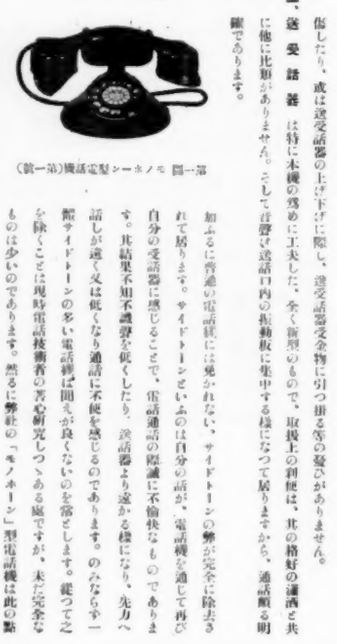
The Automatic Telephone Mfg. Co. Ltd., is under contract to supply the British Race Course Betting Control Board with a quantity of A. T. M. totalisator equipments which will be installed at various race courses throughout Great Britain. Among those already in course of preparation for this season's race meetings, and for which A. T. M. totalisator equipment is in process of construction, are Newmarket, Cheltenham, Leicester, Folkestone, Pontefract and Wolverhampton.

The A. T. M. totalisator, designed and manufactured by the Automatic Telephone Mfg. Co. Ltd., Strowger works, Liverpool, England, is covered by world patents, and inquiries relative to the equipment from outside the United States should be addressed to that company. Automatic Electric Inc., 1033 West Van Buren street, Chicago, will handle the exploitation of this totalisator in the United States, and American inquiries should accordingly be directed to this company at its Chicago office.

With the Manufacturers and Jobbers

Sales Bulletins of Automatic Electric Printed in Japanese.

The accompanying illustration shows a page reproduced from one of the sales bulletins of Automatic Electric Inc., Chicago, Ill., which has been translated and



Reproduction of a Page from the Japanese Catalog on Monophones. This Convenient Instrument Is Highly Popular Among Oriental Telephone Users.

printed in Japanese. This particular bulletin describes the various types of monophones, and is illustrated with suitable photographs of the different models of this instrument.

The beauty and convenience of this instrument is finding a ready response in the Japanese market, where a good share of all telephones ordered in conjunction with new installations of automatic equipment usually consists of monophones. In the new Mitsui Bank building of Tokyo, one of the finest bank buildings in the world, several hundred monophones of various styles are being used in the different departments, both because of the instrument's greater beauty and because of its convenience and ease of operation.

Another sales bulletin of the same company, which has been published in the Japanese language, describes the Type 5 Strowger P. A. X. (private automatic exchange). The average American encounters some difficulty even in thumbing through these bulletins, since their front cover corresponds to our back cover, the leaves being turned from left to right as one goes through the pamphlet, just opposite to our usual method. Incidentally, the Strowger P. A. X. is another piece of up-to-date equipment which the Japanese are rapidly adopting and putting to use.

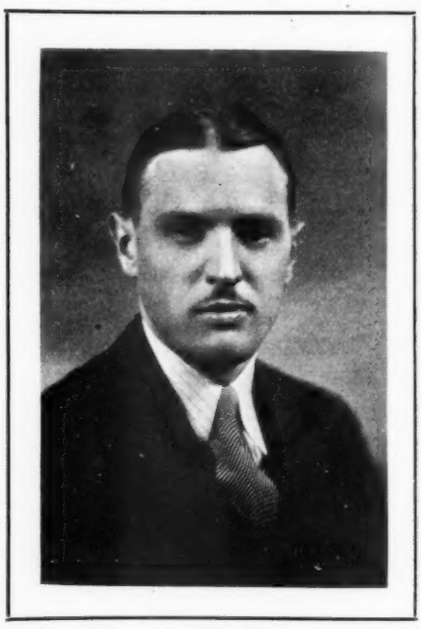
One of Tokyo's largest mercantile establishments, the Matsuya Department Store on the Ginza, has recently adopted a Type 5 Strowger P. A. X. as a step in putting its facilities on a strictly modern basis. The Hypothec Bank of Japan (Nippon Kangyo Ginko), in Tokyo, is another user of P. A. X., having adopted Type 7 (200-line) P. A. X., with a two-position attendant's cabinet, for use in its handsome new building just recently completed.

New American Electric Equipment For Sparta (Ill.) Exchange

The Standard Public Service Corp. of Columbus, Ohio, has recently completed its plans for converting the exchange at Sparta, Ill., to central battery working. The new equipment has been ordered from the American Electric Co., Inc., and will be placed in service in approximately 90 days.

The latest design monotype junior board of 600 lines' capacity will replace the magneto switchboard now in service. It is to be equipped with 360 local lines and 40 toll and rural lines—all of the associated line-lamp type. All cord circuits are to be full universal with arrangement for two-party ringing. Supplementary protector equipment and power plant apparatus and to be furnished with the switchboard.

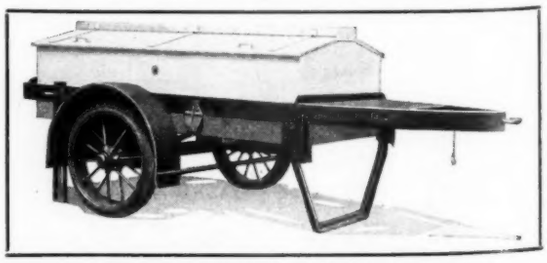
Four hundred and fifty common battery wall and desk sets were also ordered from the American Electric Co. All of the desk sets are to be of the monophone type as J. E. Albert, vice-president and general manager of the Standard corporation, has tentatively adopted the policy of furnishing only the monophone type of instrument when a subscriber wants a desk telephone.



J. E. Albert, Vice-President and General Manager of the Standard Public Service Corporation of Columbus, Ohio.

All-Steel Tool Boxes for Use of Maintenance Departments.

Maintenance departments of telephone companies will be much interested in the series of all-steel tool boxes being manufactured by Littleford Bros., Cincinnati, Ohio. There are three types of boxes—the



View of the Littlefort All-Steel Tool Box.

portable heavy-duty box, the portable utility box and the stationary storage box. Each type is made in two sizes. The all-steel heavy duty tool box No. T-2½ is shown in the illustration.

These boxes are all designed and constructed for the proper storage and transportation of melting furnaces, lead pots, oil cans, rolls of wire, picks, pipe wrenches, tape, solder, babbitt, lanterns, etc. Littleford all-steel tool boxes are declared to be proof against weather, fire and theft. For complete information and prices write to Littleford Bros., 423 E. Pearl street, Cincinnati, Ohio.

Do/More Chair Co. Issues New Attractive Booklet.

Do/More Chair Co., Elkhart, Ind., recently issued its new booklet "A Word on the Executive's Physical Power," which presents in an attractive manner the importance of correct posture in business. The booklet has 22 pages printed on enamel stock, and contains many illustrations.

Statements of eminent physicians on the importance of correct seated posture and health are given in the introductory pages. Some of the topics discussed are "Freedom for Vital Organs," "Improved Heart Action," "Proper Posture from a Fitted Chair," "Requirements for Proper Seating," "The Seat That Induces Correct Posture," "Oxygenated Blood for the Brain," "Build Your Body As You Sit," and many others.

Six styles of Do/More chairs are next illustrated and the last two pages give illustrations of installations of Do/More chairs in four large offices. A list of organizations which have adopted the Do/More idea of seating is on the last page.

Copies of this interesting booklet may be obtained upon request to Do/More Chair Co., Elkhart, Ind.

Stromberg-Carlson Radios Displayed to Music Supervisors.

E. R. Stonaker, H. A. Beach and C. H. Bergmann, consulting engineer, radio manager, and sales engineer, respectively, of the Stromberg-Carlson Telephone Mfg. Co., represented that company at the Music Supervisors' convention in Chicago March 24 to March 28. Stromberg-Carlson displayed radio receiving sets and apparatus suitable for school use.

Graybar Electric Representatives Visit Plant of FWD Company.

Tuesday, March 18, 1930, will be remembered as a pleasant and profitable day by members of the FWD Co. and the Utility Supply Co., Clintonville, Wis. On Tuesday morning the Graybar "Unlimited" rolled into Clintonville with its group of 44 electric men who had come from all parts of the United States. These men represented one of the greatest selling organizations in America. Along with other

Switchboard Cords

Tough as a rawhide thong—and as flexible, are switchboard cords when made by R-L. Tough to take the gaff of daily hard use and flexible to reduce the factor of fatigue.

Eight major points of construction make this cord your logical chocie when quality and economy decide your purchases.

R-L Switchboard cords are furnished in five standard colors to fit any ize or make of plug.

Your inquiry as to further details and prices will receive prompt attention when addressed to

RUNZEL-LENZ ELECTRIC MFG. CO.
1751 N. Western Ave., Chicago, Ill.
Dependable Since 1904

Underwriters and Distributors of Independent Telephone Company Securities

Our 19 years' experience in the telephone and public utility fields enables us to be of real service to you.

□

We welcome your inquiries for financing or outright purchase

□

CAMMACK, CLARK & COMPANY, Inc.
208 S. La Salle St.
Chicago

The *Handyman* GUY STRETCHER

ONE man does the work of a gang with this most useful tool—and in less time. Does a better job than any man-power effort. Takes up three and one-half feet of slack without new hitch. Used also for pulling up underground cable, or taking up slack for splicing, also for stretching messenger wire. Invaluable for lifting cable reels and other heavy objects. Write for descriptive matter and prices.

Harrah Manufacturing Company
Bloomfield, Indiana

Group of Graybar Electric Co. Representatives From the General Office, New York, and From 37 Points in the United States Between Boston and San Francisco, Minneapolis and Jacksonville, at Clintonville, Wis., Where During a Junket Among the Companies Whose Products Graybar Sells, These Men Were Guests for the Day of the Four Wheel Drive Auto Co. and the Utility Suppy Co.

line materials, they sell FWD line construction trucks and derricks, winches, trailers, cable splicers' carts, etc., for the Utility Supply Co.

After the preliminaries were over, the group lunched at the FWD barracks. This was followed by demonstrations of earth-boring machines, papers on the advantages of FWD and Utility Supply products and demonstrations of FWD trucks. The afternoon was taken up with concentrated study of the products manufactured by the affiliated manufacturing concerns. The day concluded with a banquet at which talks of both serious and not-so-serious natures were given.

The atmosphere of this joint conference was permeated with the spirit of harmonious cooperative effort.

Stromberg-Carlson Junior Multiple for Illinois Exchange.

The Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., has just announced the signing of a contract with the Illinois Central Telephone Co. for a two-position junior multiple switchboard for Princeville, Ill.

The contract calls for 200 subscribers' lines and 30 toll and rural lines, complete with terminal, power and machine equipment.

Automatic Electric's Monophone Advertising for Companies.

The growing use of the monophone by Independent telephone companies has given rise to a number of requests for suggestions as to the best methods of letting telephone subscribers know about this popular hand-set type instrument and its advantages.

In answer to these requests, Automatic Electric Inc., Chicago, Ill., the designer and manufacturer of the monophone, has prepared complete advertising plans for the use of any telephone company that wishes to take full advantage of the revenue-producing possibilities of this type of telephone.

Last week an announcement of this plan was sent to operating companies, with samples of the advertising material available. This material includes a small circular, attractively printed in two colors. Copies of this are furnished free of charge to any telephone company for distribution to its subscribers, either through the mail or over the commercial office counter. This circular is furnished illustrating either the dial or manual type of monophone.

Proofs of newspaper advertisements are also furnished, together with sets of matrices, in case the telephone company wishes to supplement the circular with general newspaper advertising. The matrices are furnished free of charge in either one column or two-column sizes, and showing either the dial or manual type of telephone. The proofs contain suggestions for copy as well, which, however, may be modified to suit local conditions.

It is believed that by the use of this material, which has been prepared by the advertising staff of Automatic Electric Inc., telephone companies will be able to increase very substantially the number of telephones in service, thus adding to gross revenues.

In offering this material to telephone companies, Automatic Electric Inc. announces that no obligation is incurred by the telephone company in any way.

Paragraphs.

EDWIN N. HAZLETT has recently joined the sales engineering department of the Copperweld Steel Co., Glassport, Pa. Mr. Hazlett graduated from the University of Pittsburgh in 1928, and then completed the apprentice engineering course with the Duquesne Light Co. He has been connected with the distribution department of the Duquesne Light Co. at McKeesport, Pa., on transmission operation work.

Prices in the Metal Markets.

New York, March 24: Copper—Quiet; electrolytic spot and future, 18c. Iron—Quiet; No. 2 f.o.b. eastern Pennsylvania, $18.50@20; Buffalo, $16.50@17; Alabama, $13@15. Tin—Firm; spot and nearby, $37.87; future, $38.12. Lead—Steady; spot, New York, 5.50c; East St. Louis, 5.40c. Zinc—Easy; East St. Louis spot and future, 4.85. Antimony—7.87c.

Condensed Telephone News

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items Relating to Construction, Rebuilding, or Changes in Their Plants and Systems

New Incorporations and New Telephone Companies.

RAYMOND, S. D.—Raymond Telephone Co., capitalized at $25,000, has been incorporated.

WHITE LAKE, S. D.—The White Lake & Southwestern Telephone Co. recently filed articles of incorporation.

WILTON, WIS.—The Union Cooperative Telephone Co. has been incorporated with a capital stock of $15,000, or 600 shares at $25 each. Henry Steinhoff, J. W. Pollard, E. M. McCann, all of Wilton, are the incorporators, together with Otto W. Sprecher, of Sparta.

GOODLAND, IND.—Articles of incorporation have been filed with the secretary of state in Indianapolis by the Newton White Telephone Co., with a principal place of business at Goodland. The corporation has an initial capital stock of 1,000 shares having a declared par value of $100 each preferred and 1,000 shares of common stock having no declared par value. It is formed "to buy, own, build and operate telephone exchanges and lines." The first board of directors is composed of W. W. washburn, F. Kennedy and M. Kilgore.

Franchises.

MARTINSVILLE, ILL.—Martinsville will soon have 24-hour service, according to E. A. Purcell, vice-president and general manager of the Martinsville Telephone Co. Mr. Purcell has presented a request to the City Council for a 25-year franchise.

TUSCOLA, ILL.—The city council here recently passed an ordinance granting the Standard Telephone Co. a 25-year franchise here.

CANOVA, S. D.—The question of a renewal of the telephone franchise of the Central West Public Service Co. will come before the voters of Canova at the annual municipal election in April. The franchise of the company for its telephone system

Western Telephone Directory Co.

A Telephone Directory Advertising Sales Organization

Wichita, Kan. Main Office Chicago
816 Brown Bldg. 1004 Baltimore Ave. 100 W. Monroe
Telephone Bldg., Kansas City, Mo.

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Universal Insulators

will support your drop wires to your entire satisfaction and at a minimum cost. Are you a user? Samples free on request.

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CEDAR POLES
Prompt Shipment via Rail or Water
CASCADE TIMBER CO.
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SPOONER & MERRILL, Inc.
CONSULTING ENGINEERS
Specialists in Public Utilities
TELEPHONE - ELECTRIC - GAS
WATER - RAILWAY
Valuation—Examinations—Engineering
CHICAGO, ILLINOIS
20 No. Wacker Drive

NILCO
SWITCHBOARD LAMPS
NILCO LAMP WORKS, INC., Emporium, Pennsylvania

THE BOWDLE SYSTEM
Always shows you where you stand. We have solved the bookkeeping problem of a large number of companies.
Write us about our monthly audit.
Bowdle Accounting Systems
Cerro Gordo, Illinois

NAUGLE POLES
Northern and Western Cedar
Butt-treated or Plain
NAUGLE POLE & TIE CO.
59 East Madison St., Chicago

expired about a year ago and had not been renewed.

Elections.

TAMPA, FLA.—W.G. Brorein was reelected president of the Peninsular Telephone Co. at its annual meeting recently. Other officers elected were: Carl D. Brorein, vice-president and general manager; C. E. Archer, treasurer; Frank D. Jackson, secretary; J. C. Handly, assistant treasurer and C. E. Wilson, assistant secretary. Directors are: W. G. Brorein, Carl D. Brorein, J. A. Griffin, Frank B. Jackson, of Tampa; S. A. Hopkins, Columbus, Ohio; Murray H. Coggeshell, New York; Earl L. Peters, Toledo, and E. H. Gerry, Providence, R. I.

CHICAGO, ILL.—At the annual meeting of the Community Telephone Co., the retiring directors were reelected.

SECOR, ILL.—At the annual meeting of the Secor Telephone Association, the new directors elected were: Louis Powell and C. B. Ripple. William Gieselman was reelected president and W. R. Paluska reappointed manager for this year. The association has just completed one of its most successful years under the management of Mr. Paluska, who has done a great deal to improve the service and outside plant. Several leads have been rebuilt and an extensive rebuilding program for the coming year is being planned.

OLIN, IOWA—Officers of the Olin Mutual Telephone Co. were reelected at the annual meeting, as follows: Frank Easterly, president; Gilbert Blayney, vice-president; Fred Engelking, manager; Guy showed receipts during the year of $6,331.74; disbursements of $6,214.80.

OXFORD, IOWA—The Clear Creek Telephone Co. at the annual stockholders' meeting elected C. E. Allen, president; A. E. Reeves, vice-president; Yvo Floerchinger, secretary-treasurer, and Roger Reeves, Guy Irvin and Arthur Colony, directors.

THEODORE GARY AND COMPANY
KANSAS CITY, MISSOURI

Eighty-seventh Consecutive Quarterly Dividend

The regular quarterly dividends of 40c a share on the No Par Preferred stock and the usual dividend on the Common stock has been declared payable April 1, 1930 to the stockholders of record as of the 31st day of March, 1930 at 3:00 p. m. The books will be closed to transfer on March 15th and re-opened on April 1, 1930.

(Signed) C. A. BENNETT,
Senior Vice-Pres. and Treas.
March 12, 1930.

Diversified Investments Incorporated
Kansas City, Missouri

The regular quarterly dividends of $1.75 per share on the 7% First Preferred Stock; $1.00 per share on the Participating Preferred (formerly Class A) Stock; $1.00 per share on the Class C Stock, and dividends on the Class A Common Stock, payable either in stock at the rate of 1/50th of one share, or in cash at the rate of 50c per share, will be paid on April 15, 1930 to the stockholders of record on April 1, 1930, at 3:00 o'clock p. m.

V. E. CHANEY,
Vice-President & Treasurer.

Valuation—Supervision—Plant—Inductive Interference
Expert Administrative Counsel for Utilities
JAY G. MITCHELL
TELEPHONE ENGINEER
Member A. I. E. E.
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